BOOK OF ABSTRACTS

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The Abstracts

The following abstracts are presented as they were submitted

#4227094

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Please describe other topic Kidney transplantation AND histology

Abstract title Does total inflammation in early kidney graft biopsies predict progression of fibrosis and transplant function at 1 year post-transplant?

Abstract text

Background:
The future impact of inflammation, especially in fibrosis, detected in kidney graft biopsies early after transplantation has not been settled. We investigated whether inflammation (within and/or outside fibrotic areas) at week 6 could predict progression of fibrosis at 1 year and also influence graft function at year one. A 10% step score was applied to potentially improve sensitivity compared to the Banff classification.

Methods:
Renal graft recipients during 2010 with adequate 6 week and 1 year transplant biopsies were included. Standard immunosuppression: Basiliximab, CNI, MMF and steroids. Biopsies were scored by two experienced renal pathologists according to current Banff criteria. Additionally inflammation inside and outside fibrotic areas and fibrosis were scored in a 10-graded semi-quantitative eyeballing system 0-100%. The chronic allograft damage (CADI) was calculated. Inflammation parameters at week 6 as riskfactors for progression of fibrosis were assessed in linear or logistic regression models for continuous change scores or dichotomous progression scores as appropriate.

Results:
312 biopsies (156 recipients) were included, 114 (73%) were males, mean age donor /recipient 50.6/ 54.1. Sixteen recipients were DSA positive at transplantation, 12 developed de novo DSA and 48 experienced a biopsy proven rejection within one year. Fibrosis progressed significantly from week 6 to 1 year (Table). No significant positive association was found between any inflammation parameter at week 6 and change in fibrosis scored according to Banff, in 10% steps or with CADI. Δ eGFR increased by 3.6 ml/min at 1 year. Change in kidney function was not associated with inflammation at week 6.

Conclusion:
Inflammation detected in kidney transplant biopsies at week 6 did not predict progression of fibrosis or loss of graft function at 1 year post-transplant. Scoring in 10% steps did not change these results.

BIOPSYFINDINGS	**6 weeks**	**1 year**	***p-value***
Banff interstitial fibrosis (ci) score, mean ±SD	0.81 (±0.65)	1.13 (±0.87)	<0.001*
Banff tubular atrophy (ct) score, mean ±SD	1.01(±0.45)	1.18 (±0.7)	0.004*
Banff ci+ct (IFTA) score, mean ±SD	1.81 (±0.97)	2.31 (±1.49)	<0.001*
Banff total inflammation (ti) score, mean±SD	0.76 (±0.69)	0.82 (±0.8)	0.3*
Chronic allograft damage index (CADI) score, mean ± SD**	3.4 (±2.1)	3.8 (±2.6)	0.15*
10% interstitial fibrosis score, mean ±SD	0.68 (±1.1)	1.5 (±1.9)	<0.001*
10% total inflammation weighted %, mean ±SD	16.4 (±9.9)	17.8(±13.0)	0.2*
10% inflammation inside fibrosis weighted %, mean ±SD	5.8 (±6.5)	8.5 (±11.0)	0.02*
10% inflammation outside fibrosis weighted %, mean ±SD	10.6(±6.0)	9.4 (±6.6)	0.001*
LINEAR REGRESSIONANALYSIS of change in 10% Fibrosis from 6 weeks to 1 year			
Risk factor at 6 weeks	**beta**	**95% CI**	***p-value***
Banff total inflammation, ti	-0.19	-0.63 to 0.25	0.4
10% total inflammation weighted	-0.024	-0.054 to 0.006	0.1
10% inflammation inside fibrosis weighted	-0.06	-0.11 to -0.018	0.006
10% inflammation outside fibrosis weighted	-0.008	-0.04 to 0.06	0.8

* Wilcoxon sign rank test; ** CADI score 0-21

#4626357

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Abstract topic	Other
Please describe other topic	Clinical trial, new direct antivirals in HCV infected CKD patients
Abstract title	C-surfer : grazoprevir plus elbasvir in treatment-naive and treatment-experienced patients with hepatitis c virus genotype 1 infection and chronic kidney disease

Abstract text

Introduction:

HCV infection in patients with chronic kidney disease stages 4 and 5 (CrCl <30 mL/min ± dialysis-dependence) is associated with an increased risk of death and kidney transplant failure. HCV-infected patients with CKD4/5 have limited HCV treatment options. We conducted a Phase 3 trial of grazoprevir (GZR, an NS3/4a protease inhibitor) and elbasvir (EBR, an NS5A inhibitor) in HCV G1-infected patients with CKD4/5. Methods: 224 patients with CKD4/5 were randomized to immediate treatment with GZR 100 mg / EBR 50 mg once-daily for 12 weeks or deferred treatment (placebo then active dosing). An open-label GZR/EBR arm included 11 patients who underwent intensive pharmacokinetic (PK) sampling. The primary end point was sustained virologic response at follow-up week (FUW) 12 (SVR12; COBAS TaqMan v2.0 [LoQ 15 IU/mL]). The modified full analysis set (mFAS, patients in the immediate and intensive PK arms who received ≥1 dose of study drug, excluding deaths and discontinuations unrelated to study drug) was pre-specified as the primary efficacy analysis population. Safety was evaluated in the randomized GZR/EBR arm and the placebo phase of the deferred arm.

Results:

235 patients received ≥1 dose of study drug (immediate, n=111; PK, n=11; deferred, n=113): 52% had G1a infection, 80% were HCV treatment-naive; 6% were cirrhotic, 73% were male, 46% were African American, 34% had diabetes, 19% had CKD4, 81% had CKD5, and 76% were on hemodialysis. 6/122 (4.9%) patients in the GZR/EBR arms discontinued prior to FUW12 and were excluded from the mFAS population (vs. 6/113 [5.3%] in the placebo arm). SVR12 was achieved in 115/116 (99%, 95% CI 95.3, 100) patients in the GZR/EBR arms: 1 non-cirrhotic patient with GT1b infection and CKD stage 5 relapsed at FUW12. Serious AEs occurred in 16 (13%) and 18 (16%) patients in the GZR/EBR and deferred arms, respectively. 0% and 4% of patients in the active and placebo groups, respectively, discontinued therapy due to an AE. Most common AEs in the active arms were headache, nausea, and fatigue.

Conclusion:

Once-daily GZR/EBR for 12 weeks was highly effective and well tolerated in patients with HCV G1 infection and advanced CKD.

#4144765

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Abstract topic Renal Replacement Therapy

Abstract title Microembolies of air are deposited in lungs, brain and heart in patients.

Abstract text

Previous studies show that microembolies of air develop in the haemodialysis circuit but also in the fluid infused into patients. The aim of this study was to clarify if such air embolies are immediately adsorbed when they enter blood or if they remain in circulation, to what extent such microembolies may enter into organs such as lungs, brain and heart.

Material and method:

Post-autopsy tissue from a total of 43 autopsied patients were investigated for the presence of microembolies of air. Group 1 consisted of 24 haemodialysis patients while Group 2 consisted of 19 patients who died from amyotrophic lateral sclerosis. To discriminate between air bubbles caused by artificial contamination during autopsy versus in vivo deposited microembolies (ME) we stained the tissue with a fluorescent antibody against fibrinogen. If a microbubble of gas is covered by a fibrin embolus it is counted as positive. Each tissue preparation was investigated for ME's per 25 microscopic fields (600 x). Only one tissue preparation was used for each available diseased patient and organ.

Results:

Comparison between group 1 versus Group 2 showed in median ME's/tissue section (range, n=available sections) for lungs 7 ME's (2-17, n=19) versus 3 (0-20, n=17, p=0.001), myocardial tissue 2 (1-5, n=13) versus 1 (0-5, n=19, p=0.17) and brain 7 (1-14, n=9) versus 2 (0-20, n=19, p=0.001). In 2 of 23 of the HD patients and 10 of 19 ALS tissue without ME's were found (p=0.002). Significantly more ME's were found in lungs versus heart or brain.

Conclusion:

Data indicate that many patients are exposed to deposits of ME during hospital stay. In haemodialysis patients the risk is significantly greater for microembolies of gas. Repeated exposure such as 3 times/week in HD patients will result in accumulation of ME over time and add on to tissue injury. We recommend careful handling of infusions and injections as well as using optimal air traps in HD.

#4212931

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Abstract topic	Renal Replacement Therapy
Abstract title	Investigation of skin and plasma autofluorescence in hemodialysis with either glucose free or glucose containing dialysate.

Abstract text

Advanced glycation end products (AGE) are a measure of cumulative metabolic and oxidative stress and cytokine driven inflammatory reactions. AGEs are generated by non-enzymatic, irreversible reactions when protein is exposed to carbohydrates like glucose. AGEs contribute to cardiovascular complications of hemodialysis (HD) patients. Skin autofluorescence (SAF) is related to the accumulation of AGE, and is a strong prognostic marker (OR 3.9) on mortality in these patients. In previous studies we were able to show that HD significantly reduced plasma autofluorescence but not SAF. This prospective controlled interventional longitudinal study was performed to investigate whether glucose free in dialysate (GFD) can change SAF in a HD population.

Material and methods:

SAF was measured with an AGE Reader in patients on HD during standard treatment with a glucose-containing dialysate (n=24). One month later the patients were switched to a GFD for a 2 week period and new measurements were performed after 1 and after 2 weeks with the GFD. Non-parametric, paired statistical analyses were performed between the 3 sample periods. Mean values and standard error of the mean (±) are given.

Results:

SAF measured before HD increased from 3.95 (±0.13) at start to 4.17 (±0.13) at week 1 (p=0.032) and 4.18 at week 2 (±0.13, p=0.046). The SAF values after HD did not change from the start of the period (mean 3.98 ±0.13 Units) compared to week 1 (3.96 ±0.13 Units) and week 2 (4.10 ±0.14 units). There was a 5.2% reduction of SAF after versus before the HD at week 1 (p=0.002). The reduction of 2% after the HD at week 2 was not significant. There was no significant difference between the values at week 1 versus week 2 of glucose free dialysis.

Conclusions:

HD to a limited extent removes AGEs from plasma. Investigated for the first time, we can show that a GFD may result in a significant reduction of AGEs from tissue using SAF as a marker. This effect is independent of the removal of AGEs from plasma. According to former results there was a seasonal variation, with an SAF increase, during the first period of the year. Data indicate that HD with GFD may counteract the load of AGEs.

#3579769

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Abstract topic	Other
Please describe other topic	Transplant kidney biopsies
Abstract title	High Resistive Index in transplant kidneys is a possible predictor for biopsy complications

Abstract text

Introduction:

Transplant kidney biopsies are performed to determine a histological diagnosis for specific treatment. The aim of this study was to investigate if the Resistive Index (RI) and histological findings are risk factors for biopsy complications.

Methods:

We have designed a protocol for registration of various factors and complications associated with renal biopsies. 359 consecutive transplant kidney biopsies (227 men and 132 women, median age 54 years) were prospectively included. RI (n=252, median 0.7) measured by ultrasound, histological diagnosis and biopsy complications were registered. Biopsy needles were of the size of 16 or 18 gauge (median 18). Biopsies were performed by radiologists (87%) and nephrologists (13%) and, were carried out as outpatient- (63%) and inpatient-biopsies (37%). Usually three passes per biopsy (median 3) were performed.

Results:

The overall complication rate was 7%, divided into major (4.7%) and minor (2.3%) complications. A RI greater than 0.8, compared to less than 0.8, was a predictor for major biopsy complications (13.3% versus 2.7%, Risk Ratio 5, Confidence Interval 1.5-16.5, p=0.021), but not for minor or overall complications. RI was neither correlated with the degree of glomerulosclerosis nor interstitial fibrosis. The RI correlated weakly with age (r=0.23, p<0.001), eGFR (r=-0.17, p=0.008), diastolic blood pressure (r=-0.13, p=0.047), BMI (r=0.21, p=0.001) and weight (r=0.13, p=0.038). No correlation existed between RI and systolic blood pressure, MAP or length. There was no difference in RI between genders. None of the diagnoses listed in Table 1 was a risk factor for biopsy complications. No differences existed in the frequency of biopsy complications between outpatient and inpatient or between biopsies performed by radiologists and nephrologists. The number of passes per biopsy and the biopsy needle size were no risk factors for biopsy complications. Re-biopsies were necessary in 1.9% of cases.

Conclusion:

A RI greater than 0.8 indicates greater risk for major complications and should result in greater caution after biopsy.

Table 1: Distribution of histological diagnoses, major complications, degree of glomerulosclerosis and interstitial fibrosis, age and Resistive Index (RI)

Histological diagnosis	Transplant biopsies n=359 % (M/F)	Major compl n=17 % (n)	Degree of GS %	Degree of IF %	Age, Years (mean)	RI (mean)
Rejection						
- Rejection	24.2 (58/29)	4.6 (4)	15	46	51	0.71
- Borderline changes	14.8 (29/24)	3.8 (2)	11	38	51	0.69
- Transplant Glomerulopathy	8.9 (19/13)	6.3 (2)	22	45	55	0.70
Recurrent disease						
- Recurrent IgA-nephritis	3.3 (11/1)	8.3 (1)	22	29	49	0.70
- Membranoproliferative Glomerulonephritis	1.1 (1/3)	0	11	30	54	0.85
- Diabetic nephropathy	1.4 (2/3)	0	13	22	53	0.77
Other diagnosis						
Chronic CNI-toxicity	6.7 (19/5)	8.3 (2)	19	30	50	0.71
Arteriolohyalinosis	3.1 (10/1)	0	21	31	56	0.63
Polyomavirus nephropathy	3.3 (9/3)	8.3 (1)	4	43	52	0.69
Tubulointerstitial nephritis	1.4 (3/2)	0	7	33	63	0.67
Kidney scarrring	2.5 (2/7)	0	19	46	49	0.69
Unspecific findings	14.8 (33/20)	0	7	17	51	0.69
Nephrosclerosis	2.5 (6/3)	11.1 (1)	13	40	57	0.68
Chronic damaged kidney tissue	1.1 (2/2)	0	26	44	52	0.69
Chronic pyelonephritis	1.1 (0/4)	25 (1)	31	80	59	0.78
Non-diagnostic biopsies	1.7 (2/4)	16.7 (1)			61	0.80
PTLD	1.4 (5/0)	0	4	48	42	0.68
Other diseases #	6.7 [n=24]	8.3 (2)				

de-novo membranous glomerulonephritis (0.3%), membranous glomerulonephritis (0.3%), vasculitis (0.6%), thrombotic microangiopathy (0.6%), acute calcineurin-inhibitor (CNI)-toxicity (0.8%), normal kidney (0.6%), secondary FSGS (0.3%), amyloidosis (0.3%), end-stage kidney (0.3%), glomerulosclerosis (0.6%), urothelial cancer (0.3%), unclear findings (0.8%), acute tubular necrosis (0.3%), cholesterol emboli (0.3%), fungal infection (0.3%) .

M=Male, F=Female, n=number, GS=glomerulosclerosis, IF=interstitial fibrosis, compl=complications, PTLD=Post-transplant lymphoproliferative disorder

#4193453

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Abstract topic Chronic Kidney Disease

Abstract title Sekundær amyloidose hos dialyspasienter med rusmisbruk

Abstract text

Ved amyloidose deponeres akuttfase-proteinet amyloid ekstracellulært som uløselige fibriller og kan gi organsvikt. AA amyloidose (sekundær amyloidose) ses som en komplikasjon til kronisk inflammasjon og kroniske infeksjoner(1). Biopsiverifisert sekundær amyloidose hos rusmisbrukere ble første gang diagnostisert ved Nyremedisinsk avdeling ved OUS/Ullevål i 2005. Per mars 2015 er hele 19 av totalt 99 pasienter med rusmisbruk i kronisk hemodialyse ved vår avdeling. Samtlige har en rushistorikk på over 20 år. Alle unntatt en har hatt repeterte hudinfeksjoner, i tillegg er det høy forekomst av sepsis og endokarditt. Av disse 19 har 14 (74%) fått utført nyrebiospi, og i 13 (93%) av biopsiene er det histologisk påvist avleiring av AA-amyloidose. I den siste biopsien var det kronisk glomerulonefritt. En høy andel av pasientene er dialysekrevende på det tidspunkt de innlegges/henvises til vår avdeling, såkalt crashlanders (63%). Vår erfaring er at disse pasientene ofte har pågående og utbredte hudinfeksjoner parallelt med utvikling av terminal nyresvikt. Spennvidden er stor når det gjelder overlevelse i dialyse, lengste tid er 4,8 år. Dialysetilgang er en stor utfordring hos denne pasientgruppen. I tillegg til disse 19 pasientene i hemodialyse følges flere pasienter med rusmisbruk og kronisk nyresykdom med biopsiverifisert amyloidose i predialytisk fase ved vår poliklinik. Det er flere rusmisbrukere enn noen gang i hemodialyse ved Nyremedisinsk avdeling ved OUS/Ullevål. Amyloidose er en svært viktig årsak til nyresvikt hos denne pasientgruppen, og er igjen en komplikasjon til rusmisbruk. Årsaken til den høye andelen rusmisbrukere i dialyse i Oslo er sannsynligvis multifaktoriell, der både tradisjon for intravenøs/subkutan rusinjeksjon og lengre overlevelse for rusmisbrukere spiller inn. I utgangspunktet tilbys alle pasientene i denne gruppen dialyse. Vi opplever svært varierende grad av compliance, mange tilleggsproblemer, og svært hyppige innleggelser i sykehus. Rusmisbrukere utgjør nå en stor andel av vår dialysepopulasjon og amyloidose er hovedårsaken til at de er nyresyke.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Kjønn	M	K	M	M	M	M	M	M	M	M	K	K	M	M	M	K	M	M	K
Alder(år)	45	50	41	53	63	54	46	56	45	42	47	43	58	48	50	58	52	44	58
Rus(år)	>25	>30	>25	>30	>40	>30	>15	>30	>25	>20	>25	>25	>30	>20	>35	>25	>35	>30	>30
Hudinfeksjoner	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-
HCV/HBV/HIV	B+C	B+C	B+C	C	B+Cc	B+C	B+C	B+C	B+C	B+C HIV	C	B+C	B+C	B+C	B+C	B+C	B+C	B+C	-
Kreatinin*	735	191	1244	786	648	499	677	820	1167	238	487	118	702	314	325	60	245	1356	521
Urinstoff*	35	11,2	32,1	48,1	35	28,2	12	42,4	34,7	8,0	20	5,0	39,8	12,1	20,9	7,9	18,9	51	30,7
eGFR*	7	24	4	6	8	11	8	6	4	27	8	44	8	19	18	>60	24	3	7
S-Albumin*	26	27	21	15	26	26	19	34	22	22	34	20	22	44	35	30	21	27	38
AKR*	390	540	936	1750	1253	1906	4260	701	1346	1200	956	873	320	10	?	306	1096	5990	112
Nefrotisk sx/proteinuri	+	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	-
Biopsi	Ja	Ja	Ja	Ja	Nei	Ja	Nei	Ja	Ja	Ja	Ja	Ja	Nei	Nei	Ja	Ja	Ja	Nei	Ja
Amyloidose	AA	AA	AA	AA	-	AA	-	AA	AA	AA	AA	AA	-	AKPD	AA	AA	AA	-	GN
Diagnose til dialyse (mnd)	0	16	0	0	0	0	0	0	0	3	0	11	0	240	20	108	6	0	0
Tid i dialyse /mnd	58	20	28	49	3	48	3	46	36	39	47	6	13	23	6	5	9	4	6
Aksess	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.	Kat.

*Verdier fra biopsi- eller henvisningstidspunkt.

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#3773905

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Abstract topic Renal Replacement Therapy

Abstract title Serum calcification propensity (T50) predicts cardiac and all-cause mortality in kidney transplant recipients

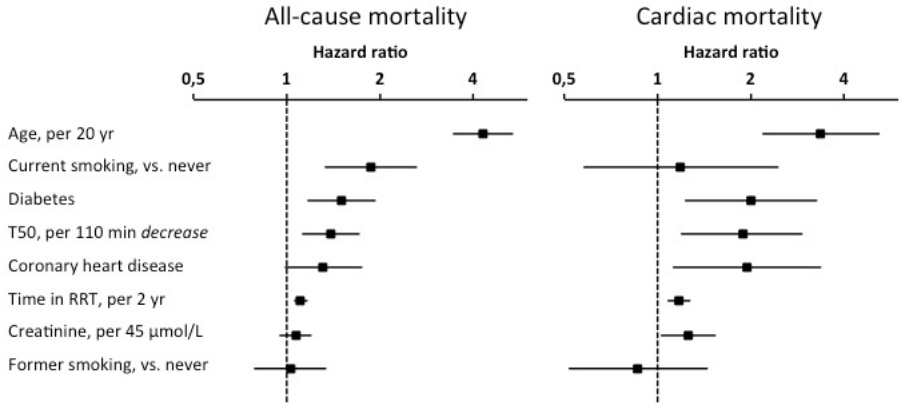
Abstract text

Introduction:
Calcification of the vasculature is associated with cardiovascular disease and death in kidney transplant recipients. A novel functional blood test measures calcification propensity by quantifying the transformation time (T50) from primary to secondary calciprotein particles. Accelerated T50 indicates a diminished ability of serum to resist calcification.

Methods:
We measured T50 in 1435 patients 10 weeks after kidney transplantation during 2000-2003 and 2009-2012. Aortic stiffness was measured by pulse wave velocity (PWV) at week 10 and after one year in 589 patients from the second era.

Results:
Mean T50 was 196 ± 72 minutes. The most influential clinical correlates of an accelerated T50 were higher serum phosphate and lower albumin, other significant correlates included diabetes, deceased donor, first transplant, rejection, stronger immunosuppression and first era (R2=0.44). During the first year of follow-up 156 (26.5%) patients increased more than 1 m/s in PWV, but mean PWV did not change. T50 was neither associated with PWV at baseline nor progression in PWV. During a median follow-up of 5.1 years, 283 patients died, 70 from a cardiac cause. Cardiac death was ascribed to myocardial infarction, heart failure and sudden death in 21, 6 and 43 patients, respectively. In Cox regression models, an accelerated T50 was strongly and independently associated with both all-cause and cardiac mortality (low vs. high T50 quartile, hazard ratio 1.60 (1.00-2.57), Ptrend=0.03 and 3.60 (1.10-11.83), Ptrend=0.02, respectively). The relative contribution of risk factors is shown in the Figure, with continuous risk factors scaled to the interquartile range. Of note, an interquartile decrease in T50 of 110 minutes increased the risk of mortality to a similar extent as the presence of diabetes or coronary heart disease.

Conclusion:
Calcification propensity (accelerated T50) is strongly associated with all-cause and cardiac mortality of kidney transplant recipients. Whether therapeutic improvement of T50 improves outcome awaits clarification in a randomized trial.



Caption file attachments:
Risk factors for mortality (per interquartile range change)

#4231724

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Abstract topic Acute Kidney Injury

Abstract title Acute kidney injury following cardiac and thoracic aorta surgery

Abstract text
Introduction:
Acute kidney injury (AKI) is a common and a serious complication of cardiac and major vascular surgery. The aim of this study was to examine time trends in incidence and survival of patients diagnosed with AKI following cardiac and thoracic aortic surgery in a well defined cohort of patients.
Methods:
This was a retrospective study of all cardiac and thoracic aorta procedures in Iceland from Jan 1st 2007 to Dec 31st 2014. AKI was diagnosed according to the KDIGO criteria, based on serum creatinine values found in the electronic database of the clinical laboratory at our institution. Survival status for all patients was verified at Statistics Iceland. The epidemiology and clinical outcomes were compared between first and second half of the study period using Chi-squared and Kaplan Meier method. Thereafter and propensity score matching analysis was used to compare AKI and non-AKI patients.
Results:
During the study period 2224 patients underwent a total of 2,502 surgeries, of which 28.4% were acute procedures. Median (range) age at operation was 67 (18-97) years and 70.7% of patients were men. AKI was diagnosed in 417 of the cases (16.7%); 302 (12.1%), 69 (2.9%) and 46 (1.8%) of stage 1, 2 and 3, respectively. Incidence of AKI decreased from 19.2% in the first period to 14.5% in the second period ($p=0.002$). Postoperative survival of AKI patients at 30 days and 1 year did not differ between time periods; it was 82.6% vs 83.8% and 79.5% vs 76.8%, respectively ($p>0.10$). Overall survival at 3 years was significantly lower in AKI patients compared with non-AKI patients, or 71.4% vs. 87.9% ($p<0.0001$). After propensity score matching on co-morbid conditions and peri-operative variables (full matching available for 359 AKI patients), patients with AKI continued to have worse long-term survival or 74.1% vs. 81.4% at 3 years ($p=0.04$).
Conclusion:
Post-operative AKI following cardiac and thoracic aorta surgery has decreased but still affects one in seven patients. Mortality of patients with AKI is significant and remains unchanged. AKI is also an independent predictor of long-term mortality.

#3892890

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Abstract topic Acute Kidney Injury

Abstract title One-year dialysis dependency and survival in patients treated with intermittent renal replacement therapy for acute kidney injury

Abstract text

Introduction:

Acute kidney injury (AKI) requiring renal replacement therapy (RRT) is associated with significantly increased mortality. AKI also increases risk for chronic kidney disease (CKD) and RRT dependency. Most previous studies of RRT- treated AKI have mostly included intensive care unit (ICU) patients receiving continuous modalities of RRT, and only very few have reported outcome of patients treated solely with intermittent modalities of RRT started both in and outside ICUs. This study focused on AKI patients exclusively treated with intermittent RRT in ICUs and non-ICU dialysis units.

Methods:

Patient inclusion took place from 1 September 2011 to 1 February 2012 in Finland, in 17 ICUs and 18 nephrological (non-ICU) dialysis units. The ICUs that participated in this study generally take care of critically ill, unstable operative and non-operative patients whereas the nephrological dialysis units perform the needed RRT after which the patients are discharged back to normal wards. ICU and non-ICU patients (total n=138; 65 ICU, 73 non-ICU) requiring RRT for AKI and chosen to receive intermittent RRT were included (as part of the prospective FINNAKI Study). Patient and RRT characteristics as well as outcomes were registered.

Results:

Mortality within 90 days was 22% (14/65) and 18% (13/73), in ICU and non-ICU patients, respectively, and 29% (19/65) and 37% (27/73) within one year (Table 1). Significantly more of the non-ICU patients became dialysis-dependent compared to ICU patients (37% vs. 15%, p=0.003). At one year, 70 of 138 patients (51%; 95% Confidence Interval, CI 42.4-59.1%) were either deceased (33%) or dialysis-dependent (17%). Pre-existing CKD and chronic heart failure as well as acute infections were significantly more common among non-ICU patients.

Conclusions:

Outcome of AKI patients treated with intermittent RRT is dismal with regard to one-year mortality and dialysis-dependency. Pre-existing CKD is associated with poor outcome especially in non-ICU patients. Acute infections seemed to be an important contributing factor for AKI in CKD patients.

Table 1. Dialysis dependency and survival of study patients within one year.

Outcome	All patients*	ICU patients*	Non-ICU patients*	P value
90-day mortality	27/138 (19,6; 12.9-26.2)	14/65 (21.5; 11.5-31.5)	13/73 (17.8; 9.0-26.6)	0.669
One-year mortality	46/138 (33.3; 25.5-41.2)	19/65 (29.2; 18.2-40.3)	27/73 (37.0; 25.9-48.0)	0.369
Dialysis dependency - one-year survivors	24/92 (26.1; 17.1-35.1)	7/46 (15.2; 4.8-25.6)	17/46 (37.0; 23.0-50.9)	0.031
Combined outcome	70/138 (50.7; 42.4-59.1)	26/65 (40.0; 28.1-51.9)	44/73 (60.3; 49.0-71.5)	0.026

*Number of patients with the outcome out of all patients (%; 95% CI)

#4223954

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Abstract topic Chronic Kidney Disease

Abstract title Indication for novel therapies for ADPKD ? Fall in eGFR in ADPKD patients in CKD stages 1 - 3 during 1 and 5 years using a sum of least squares regression calculation

Abstract text

Patients with ADPKD in early stages may in the future be offered specific therapy to slow growth of cysts. To be as effective as possible, it has been suggested that treatment should start early (CKD Stages 1-3) and to patients who show a more rapid progression. The present study present data from a single centre on prevalent ADPKD patients not in RRT (n=58), using the Nephrobase renal datasystem. CKD stages in 58 ADPKD patients Stage 5: 4 Stage 4: 10 Stage 3: 17 Stage 2: 15 Stage 1: 12 The 44 patiens in Stages 1-3, who might be eligible for therapy, had their loss of eGFR over time calculated using a formula based on least squares regression analysis. A minimum of 3 creatinine measurements with at least one week intervals was needed for the calculation to be performed. Progression was diagnosed if the 1 yr fall in eGFR was >= 5 ml/min, or 5 year fall in eGFR >= 10ml/min. Results Median age Stage 1-3 was 48 yrs (range: 19-74) 16 male, 27 female Measur. Measur. Progr. Progr. Stage n 1 yr 5 yrs 1 yr 5 yrs. Stage 3 17 12/17 17/17 5/12 16/17 Stage 2 15 9/15 12/15 2/9 6/12 Stage 1 12 5/12 10/12 1/5 4/10 n 44 8/26(27%) 15/39(39%)

Conclusion:

In a single centre ADPKD patient pool of 58 patients not in RRT, 44 were in Stages 1-3, of which ca 1/3 showed progress fast enough to possibly benefit from therapy with a potential for slowing cyst-development.

#4223819

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Abstract topic Chronic Kidney Disease

Abstract title A complication of illicit opioid injection: polyvinylpyrrolidone storage disease

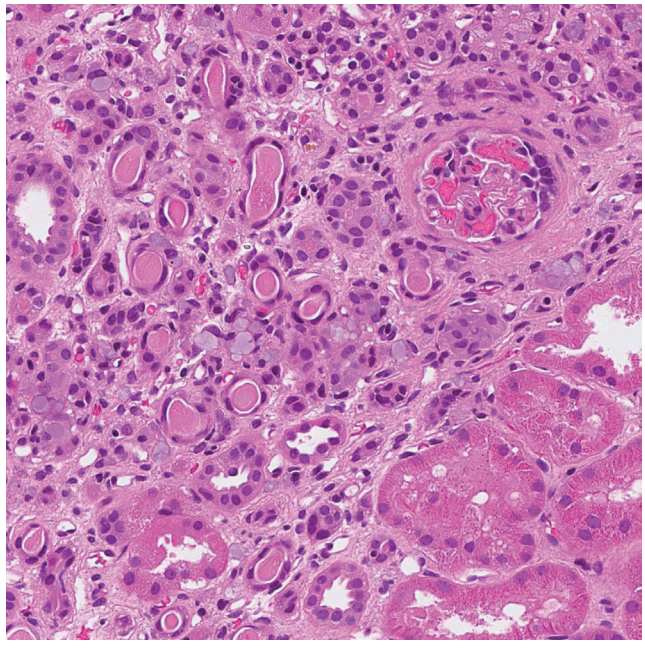
Abstract text

Introduction:
Opioid addicted patients may inject oral substitution drugs such as methadone or buprenorphine. Some of these drugs contain high molecular polyvinylpyrrolidone (PVP) as an excipient, which is not excreted from the body when given intravenously. PVP deposition is diagnosed histologically by characteristic macrophages with bluish, vacuolated cytoplasm in various tissues. We present a biopsy series from opioid addicted patients showing renal insufficiency as a main clinical sign of PVP deposition disease.

Methods:
Biopsies (n=28) and one autopsy with characteristic PVP deposition were collected between 2009 and 2013, from 13 opioid addicted patients (mean age 38 years, 12 males, 1 female).

Results:
Renal biopsies (n=8) showed interstitial PVP storing macrophages accompanied by various degrees of tubular atrophy and signs of glomerular hypoperfusion. Other main biopsy sites showing the characteristic macrophages were bone/bone marrow (n=11) and the gastrointestinal tract (n=5). Main clinical signs were reduced kidney function (mean serum creatinine 219 micromol/L) and anaemia (mean hemoglobin 9.9 g/dL). Abdominal discomfort and fractures were found sporadically. Two patients died. One autopsy confirmed PVP deposition as underlying cause of death.

Conclusion:
PVP storage is important to recognize histologically in kidney biopsies because it might explain multiorgan affection in opioid addicted patients.



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Abstract topic Chronic Kidney Disease

Abstract title Calcified Vasculature, Lipids and Kidney Function in the Elderly. A population based study.

Abstract text

Introduction:

The prevalence of chronic kidney disease (CKD) is rising, particularly among the elderly. Concomitant diseases, often present in this population, include cardiovascular disease and various lipid disorders. Currently, it is unclear if and how these comorbid diseases may predispose to loss of kidney function with age. The aim of this study was to examine the association of dyslipidemia and central vascular calcification (CVC) with kidney function in an aging cohort

Methods:

A cross-sectional analysis of 5,212 participants in the AGES-Reykjavik Study I was performed. Estimated glomerular filtration rate (eGFR) was calculated from standardized serum creatinine using the CKD-EPI equation. CVC was measured by quantitative computed tomography as the sum of calcification of the thoracic aorta. High density lipoprotein cholesterol (HDL) and triglycerides (TG) were measured and non-HDL-cholesterol (NHC) calculated. Linear regression was performed separately in males and females with eGFR as outcome. The main predictor variables included CVC in quintiles and serum lipids, NHC, HDL and TG as continuous variables, adjusted for age, body mass index, diabetes mellitus (DM), hypertension (HTN), albuminuria and history of smoking.

Results:

Mean (SD) age was 76.5 (5.5) years, 57% were females, 81% had HTN and 12% DM. Mean eGFR was 63.4 (15.2) ml/min/1.73 m2. Median CVC was 2,101 (range 0-50,360) Agatston scores. NHC was not associated with eGFR, whereas lower HDL was associated with lower eGFR in males ($p<0.05$). Higher TG and CVC levels were strongly associated with lower eGFR ($p<0.001$ and $p<0.05$ respectively). Individuals with higher level of CVC had lower eGFR in the setting of high TG, but this did only reach statistical significance in females ($p<0.01$; table). Similar interaction between CVC and the other lipids, NHC and HDL, was not present.

Conclusion:

Low fasting TG levels may be important for preserving kidney function in the elderly and may abrogate the effect of vascular calcification on the kidneys, particularly in women. This needs to be confirmed in a longitudinal study.

Table. Association of triglycerides (TG) and central vascular calcifications (CVC) with eGFR.

	MALES					FEMALES				
		low TG (60 mg/dL)		high TG (200 mg/dL)			low TG (60 mg/dL)		high TG (200 mg/dL)	
CVC**	N	eGFR*	95% CI	eGFR*	95% CI	N	eGFR*	95% CI	eGFR*	95% CI
very low	457	66.5	64.5-68.5	61.7	58.7-64.8	614	62.6	60.2-65.0	59.5	56.9-62.2
low	437	67.8	65.8-69.9	62.8	59.7-65.8	621	67.6	65.1-70.0	55.7	53.3-58.1
medium	451	67.9	66.0-69.8	62.3	59.2-65.4	565	68.0	65.4-70.7	56.9	54.4-59.4
high	412	67.9	65.9-70.0	61.0	58.0-64.0	553	66.9	64.3-69.4	55.3	52.8-57.8
very high	466	66.7	64.6-68.7	56.4	53.6-59.2	636	65.3	63.0-67.6	52.7	50.1-55.2

* mL/min./1.73 m^2

** Very low CVC: 0-600 Agatston scores
Medium CVC: 1,500-3,000 Agatston scores
Very high CVC: 6,000-50,400 Agatston scores

#4216490

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Abstract topic Renal Replacement Therapy

Abstract title Outcomes of PD-related peritonitis depending on the peritonitis microbiology I. Puide, A. Stolarova, V. Kuzema, I. Mihailova, A. Petersons P. Stradins Clinical University hospital, Latvia

Abstract text

Introduction:

Peritonitis is still the most important complication of peritoneal dialysis. The outcome of peritonitis depends on the causative agent. The aim of the study was to investigate the influence of microbiological factors on the outcome of PD-related peritonitis in the single peritoneal dialysis centre during five years period.

Methods:

We reviewed retrospectively all peritonitis episodes in all PD patients in our centre of Nephrology from 2010 until 2014. Relapses and surgical peritonitis were excluded from the analysis. Complicated course of peritonitis was defined as PD catheter removal, relapse, death. Patient demographics, peritonitis causative organisms, antibacterial resistance, empirical treatment, the outcome of peritonitis were analyzed using SPSS-22.

Results:

161 peritonitis episodes were analyzed in 82 patients, median age 65 (47-76) years, median PD vintage 21 (7,2-37) months. 60 of peritonitis episodes were in men, 104 episodes were in women. 74 (45%) of peritonitis episodes were in APD and 90 (54%) in CAPD patients. There were 126 (79%) uncomplicated and 35 (21%) complicated episodes of peritonitis treated. The course was uncomplicated more frequently in gram-positive than in gram-negative peritonitis (87,8% vs. 70,6%, $p < 0,05$), and then in polymicrobial peritonitis (87,8% vs. 50,0%; $p < 0,05$), and fungal peritonitis (87,8% vs. 0%, $p < 0,001$). Polymicrobial peritonitis was complicated more often than culture negative peritonitis (50,0% vs. 17,0%, $p = 0,02$) and gram-positive peritonitis (50,0% vs. 12,1%, $p = 0,002$). In case of resistance to the empirical antibacterial treatment the course of gram-negative peritonitis was more often complicated than in non-resistant gram-negative peritonitis (29% vs. 15%, $p = 0,009$).

Conclusions:

Gram-negative, polymicrobial and fungal effluent culture results, the resistance of gram-negative bacteria to empirical treatment were associated with a complicated course and worse outcome of peritonitis. The possible cause of the complicated course of gram-negative and polymicrobial peritonitis could be potentially high prevalence of undiagnosed surgical peritonitis.

#4154771

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Abstract topic Other

Please describe other topic Innate immune system and recipients' survival after kidney transplantation

Abstract title Imbalance between activators and inhibitors of the complement lectin pathway is associated with mortality in kidney transplant recipients

Abstract text

Introduction:
Higher incidence of malignancy and infectious diseases in kidney transplant recipients are likely related to immunosuppressive treatment after transplantation and the immune status of the recipient at the time of transplantation. The complement system is an essential component of the innate immune system. The aim of the present study was to investigate the association of effector molecules of the lectin pathway and patient mortality after kidney transplantation.

Methods:
Two mannan-binding lectin (MBL) associated proteases (MASP-2 and MASP-3), two MBL-associated proteins (MAp44 and MAp19) and osteoprotegerin were measured at the time of transplantation in 382 patients (³17 years) who were kidney transplanted in 2000-2001. The cohort was followed up until December 31st, 2010. Data on patient survival was obtained from the Norwegian Renal Registry. Cox regression analyses were conducted for each of the following variables; high MASP-2 (4th vs 1-3 quartiles), high MASP-3 (4th vs 1-3 quartiles), low MAp44 (1st vs 2-4 quartiles), low MAp19 (1st vs 2-4 quartiles) and high OPG (4th vs 1-3 quartiles). Other explanatory variables were: recipient age per year, recipient gender, living donor, donor age per year, preemptive transplantation and diabetic nephropathy.

Results:
MASP-2. High MASP-2 (=>469 ng/ml) was associated with increased mortality in multivariate Cox analysis, HR 1.56, 95% CI 1.05–2.33, p=0.03. Other significant risk factors were recipient age and diabetic nephropathy. MAp44. Low MAp44 (<1716 ng/mL) was associated with mortality in multivariate Cox analysis with HR 1.61, 95% CI 1.09–2.39, p=0.02. Other significant risk factors for mortality were recipient age and diabetic nephropathy. Preemptive transplantation showed protective effect, HR 0.60, 95% CI 0.33–0.95, p=0.03. MASP-3, Map19 and OPG were not associated with increased mortality.

Conclusion:
High MASP-2 level and low MAp44 level in kidney recipients at the time of transplantation are associated with increased long-term overall mortality. Negative impact of low MAp44 was stronger in younger recipients. No association between MASP-3, MAp19 or OPG and mortality was found.

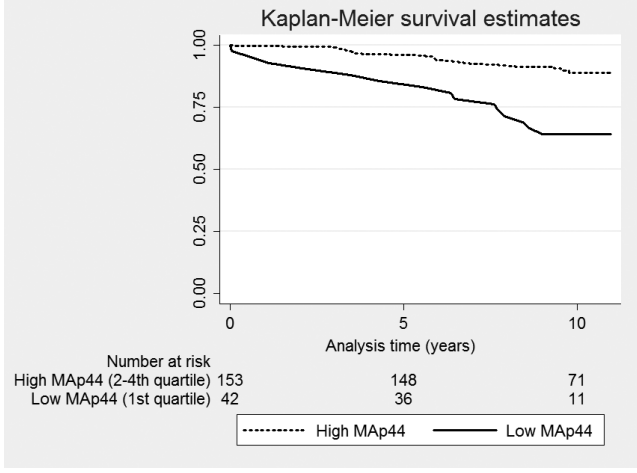

Figure 1. Plot of the cumulative survival in groups with High MAp44 versus Low MAp44: Patients age≤51.7years

#3744127

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Abstract topic	Acute Kidney Injury
Abstract title	Community acquired severe acute kidney injury (AKI) caused by hantavirus-induced hemorrhagic fever with renal syndrome has a favorable outcome

Abstract text

Introduction:

Puumala virus (PUUV) induced nephropathia epidemica (NE) is common in Finland, where every year 1,000-3,000 cases are serologically diagnosed. There are plenty of cases also in Sweden and fewer in Norway. The main manifestations of NE are fever, acute kidney injury (AKI), thrombocytopenia and increased capillary leakage. The typical renal biopsy finding is acute tubulointerstitial nephritis. According to KDIGO criteria, AKI is a common and important clinical issue that has shown in multiple studies to be a significant risk factor for mortality, as well as predispose to the development of chronic kidney disease (CKD). The aim of the present study was to evaluate the prognosis of severe AKI associated with NE and also to verify if KDIGO conclusions apply for this community acquired AKI.

Methods:

556 patients treated at Tampere University Hospital during 1982-2013 for acute serologically confirmed PUUV infection, were examined. Plasma creatinine levels during acute phase, at convalescence, and one, two, and five years after acute infection, were measured.

Results:

Plasma creatinine concentration was elevated (>100 µmol/l) in 459 (83%) patients during acute NE. 189 patients (34%) had severe AKI defined as KDIGO stage 3, i.e. plasma creatinine >353.6 µmol/l or need of dialysis. There were no fatal cases during the hospitalization or following three months. Fatality rate during the years following PUUV did not differ between patients who had suffered from severe AKI and those without severe AKI. Post hospitalization plasma creatinine values were available for 188 (34%) patients. After one year there were no differences in median plasma creatinine levels between patients with of without prior severe AKI. After five years all but one patient had normal creatinine levels.

Conclusions:

In contrast to the worldwide well-accepted KDIGO criteria, severe AKI associated with PUUV infection is not associated with excess fatality, and has a very good prognosis, both on short and long term. Therefore, the KDIGO criteria do not apply uniformly to all forms of AKI.

#4226758

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Abstract topic Chronic Kidney Disease

Abstract title Changes in the tubular proteome of 2K1C hypertensive rats

Abstract text

Background:

Tubular atrophy and interstitial fibrosis present the final stage in most forms of progressive kidney diseases. Little is known regarding changes in the tubular proteome. In this study, we investigated changes in the tubular proteome of normal or minimally damaged tubular tissue in the non-clipped kidney from rats with two-kidney one-clip (2K1C) hypertension.

Methods:

Formalin-fixed paraffin-embedded kidney sections from four 2K1C rats with hypertensive kidney damage and six sham rats were used. Tubulointerstitial tissue without discernable interstitial expansion or pronounced tubular alterations was microdissected, and was assumed to represent an early stage of chronic tubular damage in 2K1C. Samples were analyzed by mass spectrometry and relative protein abundances were compared between 2K1C and sham.

Results:

A total of 1160 proteins were identified with at least two unique peptides, allowing for relative quantitation between samples. Among these, 151 proteins were more abundant, and 192 proteins were less abundant in 2K1C compared with sham. Transgelin, vimentin and creatine kinase B-type were among the proteins that were most increased in 2K1C. Ingenuity Pathway Analysis showed increased abundance of proteins related to Rho signaling and protein turnover (eIF2 signaling and protein ubiquitination), and decreased abundance of proteins related to fatty acid a-oxidation.

Conclusion:

Tubular tissue from normal or minimally damaged hypertensive kidney damage demonstrate extensive proteomic changes with up-regulation of pathways associated with progressive kidney damage, such as Rho signaling and protein turnover. Thus, proteomics represents a sensitive tool for analysis of not yet morphologically visible tubular damage.

#3650987

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Abstract topic Hypertension

Abstract title Effects of renal denervation on kidney function and urinary markers in hypertensive patients. The ReShape CV-Risk Study.

Abstract text

Introduction:

The impact of renal sympathetic denervation (RDN) on kidney function and albuminuria is not settled. Change in kidney function has mainly been evaluated using creatinine based equations for estimated glomerular filtration rate (eGFR). Markers of tubular dysfunction have not been assessed. The aims of the study were to compare changes in kidney function by different estimating equations and to study changes in albuminuria and N-acetyl-a-D-glucosaminidase (NAG), a marker of proximal tubular dysfunction, during 6 months' follow-up after RDN in non-diabetic, treatment resistant hypertensive patients.

Methods:

Patients were recruited from out-patient clinics. Treatment resistance was defined as ambulatory daytime systolic blood pressure (SBP) >135 mm Hg while treated with ≥4 antihypertensive drugs. Investigations including 24 h urine collection and morning urine samples were done before and 6 months after RDN. eGFR was calculated using the CKD-EPI equations for creatinine, cystatin C and the combination (eGFRcre, eGFRcys, eGFRcrecys). Albumin, NAG and creatinine were measured from frozen urine specimens.

Results:

RDN was performed in 23 patients (mean age 53 (±8) years; 5 women). Mean 24h SBP fell from 154 (±20) to 144 (±16) mm Hg. eGFRcre remained unchanged, but eGFRcys and eGFRcrecys increased from 78 (±21) to 85 (±24) and from 81 (±20) to 87 (±23) ml/min/1.73 m2, respectively (P=0.007; P=0.013). Albuminuria did not change significantly, but 24 h NAG excretion increased from 2.0 (±1.2) to 2.6 (±1.6) U/24 h (P=0.03). Patients in the upper tertile of eGFRcrecys change (≥9.5 ml/min/1.73 m2 increase) were characterised by lower baseline albuminuria and lower NAG creatinine ratio at follow-up. The decrease in BP was less pronounced in this group than in patients with lower eGFRcrecys increase.

Conclusions:

eGFR increased after RDN when assessed as eGFRcys and eGFRcrecys, but not as eGFRcre. eGFR increase was related to less decrease in BP. NAG, a marker of tubular dysfunction, increased after RDN, but not in patients with larger increments in eGFR. Further studies should focus on long-time effects of RDN on kidney function and markers of kidney damage.

Table 1. Renal parametres at baseline and after 6 months

	Baseline		Follow-up		P value for difference
Estimated GFR_{crea}, ml/min/1.73 m^2	85,8	18,6	87,5	19,9	0,38
Estimated GFR_{cys}, ml/min/1.73 m^2	77,5	21,2	84,9	23,8	0,007
Estimated $GFR_{creacys}$, ml/min/1.73 m^2	81,4	19,7	87,0	22,7	0,013
Uric acid, µmol/L	410	74	412	93	0,91
Albumin-creatinine ratio, mg/mmol	0,67	0.10 - 4.08	0,71	0.00 - 1.56	0,094
Albumin excretion, mg/24 h	8,34	0.01 - 26.26	6,62	3.34 - 24.47	0,65
NAG-creatinine ratio, U/g	1,96	1.34 - 3.29	2,07	1.06 - 2.66	0,62
NAG excretion, U/24 h	1,99	1,21	2,56	1,63	0,025

Data with normal distribution are presented as mean (standard deviation); data with a skewed distribution are given as median (interquartile range)

#3467477

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Abstract topic Chronic Kidney Disease

Abstract title One- and two-year mortality prediction models for patients starting chronic dialysis

Abstract text

Introduction:

Mortality risk of patients with end-stage renal disease (ESRD) is highly elevated compared to patients without ESRD. Taking into account our limited nephrological care resources and the fact that the number of ESRD patients is constantly increasing there is a great need for means of mortality risk estimation in order to assist both in individualized patient care as well as in sound use of health care resources. Some mortality prediction models already exist, but many have shown a lack of data comprehensiveness or incompleteness of patient recruitment in their development.

Methods:

Our objective was to design a prediction model for one- and two-year all-cause mortality in patients starting chronic renal replacement therapy. In addition, we aimed to build an easy-to-apply model consisting of only a few variables. We used the comprehensive data of the Finnish Registry for Kidney Diseases with complete coverage of Finnish ESRD patients. Model training group included all incident adult patients who started chronic dialysis in Finland from 1 January 2000 to 31 December 2008 (n=4335). The external validation cohort consisted of those patients who started dialysis from 1 January 2009 to 31 December 2012 (n=1768). Prediction algorithms for one- and two-year mortality were developed using multivariate logistic regression with stepwise selection of variables. Our primary analyses included 32 variables, from which the most important ones were selected (Table 1).

Results:

Both final prognostic models, including only 6-7 variables (Table 1), showed adequate discrimination (c-statistic 0.77 and 0.74 for one- and two-year mortality, respectively). Due to a significantly lower mortality in the newer (validation) cohort, both models somewhat overestimated mortality risk.

Conclusions:

Mortality prediction algorithms could be more widely implemented into clinical treatment-planning of ESRD patients. Our prediction models perform sufficiently and are still practical in terms of number of variables, and thus could assist in individualized risk-stratification and, furthermore, in equal and fair sharing of limited health care resources.

Table 1. The variables of the final mortality prediction models.

Variables of the models	One-year model	Two-year model
	Multivariate OR (95% CI)	Multivariate OR (95% CI)
Age at RRT start, yrs	1.049 (1.039-1.059)	1.055 (1.047-1.062)
ESRD diagnosis	-	-
- Glomerulonephritis	1 (reference)	1 (reference)
- Polycystic disease	0.560 (0.282-1.114)	0.729 (0.456-1.165)
- Diabetes type 1	2,158 (1.374-3.389)	2.810 (1.979-3.991)
- Diabetes type 2	1,631 (1.127-2.359)	2.165 (1.619-2.897)
- Pyelonephritis	1,141 (0.595-2.189)	0.794 (0.458-1.377)
- Amyloidosis	3,103 (1.979-4.867)	3.715 (2.543-5.427)
- Nephrosclerosis	1.482 (0.914-2.401)	1.624 (1.101-2.397)
- Other	2.382 (1.625-3.493)	2.323 (1.700-3.174)
- Unknown	1.485 (1.003-2.198)	1.510 (1.103-2.067)
Serum albumin, g/L	0.959 (0.945-0.973)	0.956 (0.944-0.968)
Serum C-reactive protein, logarithmic	1.155 (1.074-1.243)	1.114 (1.049-1.184)
Heart failure	2.099 (1.645-2.687)	2.477 (1.983-3.095)
Serum phosphorus, mmol/L	-	-
- less than 1.53	1 (reference)	-
- 1.53 - < 2.0	0.753 (0.587-0.965)	-
- 2.0 or higher	1.152 (0.917-1.449)	-
Atherosclerotic disease	1.657 (1.301-2.110)	-
Atherosclerotic disease with limb amputation	-	1.901 (1.362-2.653)

OR = odds ratio (with 95% confidence interval), RRT = renal replacement therapy, ESRD = end-stage renal disease. Regression equation constants: -4.624 (one-year model), -4.073 (two-year model)
The 32 original variables tested: age at RRT start, gender, body mass index, ESRD diagnosis, initial dialysis modality (hemodialysis or peritoneal dialysis), laboratory test variables (each separately: blood hemoglobin, serum creatinine, serum albumin, serum ionized calcium, serum urea, serum phosphorus, serum total cholesterol, serum HDL cholesterol, serum triglyserides, serum C-reactive protein), systolic blood pressure, diastolic blood pressure, comorbidities (each separately: angina pectoris, myocardial infarction, ischemic heart disease with coronary artery bypass grafting, left ventricular hypertrophy, heart failure, atherosclerotic disease, atherosclerotic disease with surgical operation, atherosclerotic disease with limb amputation, stroke, present or previous cancer), medication for hypertension, lipid-lowering medication, lipid-lowering diet, smoking status (both separately: ex-smoker, present smoker).

#3366057

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Abstract topic Renal Replacement Therapy

Abstract title A controlled study assessing the utility of wristbands in protecting veins prior to arteriovenous fistula formation in patients with chronic kidney disease.

Abstract text

Introduction:

Education on vein preservation prior to primary arterio-venous fistula (AVF) formation is important. This controlled trial is the first to demonstrate the numbers of venepunctures that this patient population endures and to assess the role of education and aide memories in raising awareness for vein preservation.

Methods:

All patients with chronic kidney disease (CKD) referred for a primary AVF in a district general hospital between February and December 2013 were considered. On recruitment, all patients were individually educated on the importance of vein preservation. The intention group were given a wristband to wear on the proposed limb. The primary outcome measured was the number and site of venepunctures. Venepuncture incidence was monitored online and patients were telephoned at home to report the site of venepuncture. Follow-up lasted for 6 months or until an AVF was created. Exclusion criteria included comorbidities that would restrict compliance with follow-up. Social perception of the wristband was also captured.

Results:

Forty patients were included; 20 received a wrist band (mean age was 69) and the control group did not (mean age was 75). There were 6 episodes of venepuncture in the designated limb; no venepunctures occurred in limbs with wrist bands. Hospitalisation was associated with higher rates of venepuncture.

Conclusion:

Wearing of wrist bands as aide-memoires was associated with significant advantage ($t(28)=22.4$, $p < 0.0001$) for vein protection. Aide-memories appear to be especially valuable when patients are unwell and unable to communicate effectively with healthcare staff. We recommend that optimisation of vein preservation should be started earlier in CKD management. Limitations to this study include a small sample size and potential 'Hawthorne' effect on patients repeatedly being telephoned regarding venepuncture. Study was unable to capture vulnerable patients most at risk of inadvertent venepuncture due to exclusion criteria.

#4231952

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Abstract topic Kidney Stones and Bone-Mineral Disorder

Abstract title Natural history of asymptomatic kidney stones

Abstract text

Introduction:

In recent years, more frequent use of high-resolution medical imaging has resulted in increased detection of asymptomatic kidney stones (KS). The purpose of this study was to examine the frequency of clinical stone events in patients with asymptomatic KS.

Methods:

The databases at all major hospitals and imaging centers in Iceland were searched for radiologic and diagnostic codes indicative of KS in the years 2000-2008, yielding 2550 incident cases. Review of medical records revealed no prior history of nephrolithiasis or symptoms consistent with KS in 218 patients who were considered to have asymptomatic KS. The patients' records were thoroughly reviewed for symptomatic KS events defined as abdominal or flank pain and hematuria associated with stone passage and/or a stone removal procedure. End of follow-up was between June 2014 and April 2015 or at patient's death. Event free survival was examined by the Kaplan-Meier method.

Results:

Of the 218 patients, 54.6% were men and the median (range) age was 65 (11-91) years. The diagnosis was made by computed tomography in 156 (71.6%), ultrasound in 49 (22.5%) and by plain X-ray in 13 patients. A total of 17.4% were diagnosed in the first 3 years of the study period, 29.4% during the next 3 years and 53.2% during the last 3 years. The median follow-up time was 6.0 (0.0-14.5) and 6.7 (0.0-14.9) years for men and women, respectively. Twenty (9.2%) patients underwent a stone removal procedure shortly after diagnosis, 3 of whom had a second stone event. Additional 29 patients (13.3%) had a clinical stone event at a median of 2.8 (0.2-14.4) and 1.2 (0.1-9.3) years following diagnosis for men and women, respectively. When stone removal procedure of the asymptomatic stone was defined as a clinical event, a total of 49 patients experienced a clinical stone event yielding an event-free survival of 80% (95% CI, 74-85) and 73% (95% CI, 65-80), at 5 and 10 years, respectively.

Conclusions:

Approximately 10% of asymptomatic KS were considered clinically significant at diagnosis. In the remaining patients, a clinical stone event was unlikely to occur over the decade following diagnosis of asymptomatic stone disease.

#4213962

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Abstract topic Acute Kidney Injury

Abstract title Community-acquired acute kidney injury: incidence and etiologic factors

Abstract text

Introduction:
Acute kidney injury (AKI) affects 5-10% of hospitalized patients and is often a complication of medical or surgical interventions. However, limited information exists on the epidemiology of community-acquired AKI. The aim of this study was to examine the incidence and etiology in patients presenting with AKI to an emergency department (ED) of an urban university hospital.

Methods:
In this retrospective study we used the electronic patient information system at Landspitali – The National University Hospital of Iceland to identify all patients aged ≥18 years, who upon arrival to the ED in the year 2010 had an elevated serum creatinine (SCr) level. We reviewed all SCr measurements available for these patients at the University Hospital and used the KDIGO criteria to determine the presence of AKI. Clinical information on patients with AKI was extracted from medical records.

Results:
A total of 37,497 patients ≥18 years of age had 59,156 visits to the ED during 2010. Excluding scheduled re-visits, 47,558 non-planned ED admissions remained. SCr was measured in 15,623 patients for a total of 24,594 SCr measurements. An elevated SCr was observed in 2,878 patients, of whom 1080 (2.9% of patients visiting the ED) met the diagnostic criteria for AKI. The total number of AKI episodes was 1185 (2.5% of non-planned visits). The patients' median age was 75 years (range, 18-99), 54.8% were men and 21.5% had a baseline eGFR <60 ml/min/1.73 m2. Stage 1 AKI was most common, observed in 59.4% of episodes, 26.2% were of stage 2 and 14.4% stage 3 AKI. The AKI was of pre-renal nature in 88.8% of cases, with various and often multiple causes or contributing factors, including sepsis (23.2%) and volume depletion (23.9%). In 50.3% of episodes, medications were considered a contributing factor, most frequently RAS blockers (38.4%) and NSAID (11.9%).

Conclusions:
AKI is present in approximately 2.5% of ED visits to a metropolitan hospital. Most patients are elderly and pre-renal conditions account for the overwhelming majority of cases. Medications are the predominant contributing factor in a large proportion of patients, suggesting that some cases of AKI might be prevented.

#4167077

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Abstract topic Chronic Kidney Disease

Abstract title End stage renal disease predicts increased risk of death in first degree relatives in the Norwegian population

Abstract text
Introduction:
Increased risk of end stage renal disease (ESRD) and all-cause mortality in Norwegian living kidney donors was reported in 2013, most of the donors were related to the recipient. Few population based studies have investigated risk of death in first degree relatives of patients with ESRD.
Methods:
The Norwegian Population Registry, the National Cause of Death Registry and the Norwegian Renal Registry were linked, identifying first degree relatives for most Norwegian citizens and causes of death according to the International Classifications of Diseases (start 1969). Data from the Norwegian Renal Registry were used to identify first degree relatives who had developed ESRD in Norway since 1980. All subjects with a Norwegian identity number who were born in Norway and had at least one registered first degree relative were included. A cohort-design was used, with ESRD in a first degree relative as the main exposure variable and death and causes of death as the main outcome variables. Adjusted hazard ratios (aHR) were calculated using Cox regression analyses.
Results:
5,217,568 individuals were included, of whom 27,650 had at least one relative with ESRD and 844,407 died during follow-up. Individuals with a relative with ESRD, as compared to those without a relative with ESRD, had an aHR for death of 1.14 (95% CI 1.10-1.17). Excluding known hereditary renal disease, aHR decreased to 1.12 (95% CI 1.09-1.16). aHR for cardiovascular death was 1.15 (95% CI 1.10-1.21), of which aHR for cerebrovascular death was 1.34 (95% CI 1.22-1.47). aHR of death due to non-hereditary diseases of the kidneys and ureters was 2.32 (95% CI 1.84-2.94), where death due to kidney failure 1.80 (95% CI 1.26-2.56) and primary renal disease 5.88 (95% CI 4.04-8.56) were the main contributors. As compared to individuals without a relative with ESRD, death occurred 9 years earlier in individuals who died before the age of 50 and 1 year earlier in individuals who died at age 70 who had a relative with ESRD. Conclusions: ESRD in first degree relatives was associated with premature death. Death due to cardiovascular- and non-hereditary renal diseases increased the most.

#4232389

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Abstract topic Chronic Kidney Disease

Abstract title Decline in kidney function with aging: mathematical modeling of serial eGFR measurements

Abstract text
Introduction:
Decline in kidney function in the elderly is thought to be a consequence of normal aging. However, long-term prospective studies of kidney function in the general population are lacking. The purpose of this study was to characterize the changes in estimated glomerular filtration rate (eGFR) over time in a large cohort of Icelandic subjects.
Methods:
For participants aged 33-75 years in the Reykjavik Study (RS), conducted between 1967 and 1995, we identified all subsequent measurements of serum creatinine (SCr) from clinical laboratories in the Reykjavik area. The MDRD Study equation was used to calculate eGFR and various statistical models for longitudinal data were applied to characterize changes in eGFR over time. The analysis was made separately for men and women.
Results:
At least one SCr value in addition to the baseline value was identified for 14,572 participants (85.4%), of whom 51.6% were women. Mean follow-up time was 28.4 years. Decline in eGFR with age was observed to be non-linear and best represented by the class of generalized additive mixed models. A steeper decline in eGFR after age 70 years was noted. The presence of diabetes, hypertension, proteinuria and/or eGFR <60 ml/min/1.73 m2 at baseline (N=5907) associated with lower eGFR, but the rate of decline in eGFR appeared similar to the remaining individuals . Individuals who developed acute kidney injury during follow-up showed steeper age-related decline in eGFR. At age 70 years, eGFR <60, <45 and <30 mL/min/1.73 m2 was observed in 29.5%, 6.6% and 1.3% of subjects, and at age 80 years in 45.1%, 17.9% and 4.3% of subjects, respectively.
Conclusions:
Kidney function declines with age in a non-linear fashion. Assessment of the change in eGFR over the lifespan and into older age requires flexible modeling approaches. Major cardiovascular risk factors and AKI were associated with the change in eGFR with age.

#4225638

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Abstract topic Renal Replacement Therapy

Abstract title Post-transplantation diabetes mellitus: a bihormonal disease

Abstract text

Introduction:
Post-transplantation diabetes mellitus (PTDM) is primarily believed to be a variant of type 2 diabetes mellitus (T2DM). T2DM is not only characterized by insulin resistance and a-cell failure, but also increased a-cell function and hyperglucagonemia present both in the fasting state and after meals. The aim of the present study was to investigate whether hyperglucagonemia is an important mechanism underlying hyperglycemia in PTDM.

Materials:
12 renal transplant recipients with PTDM and 12 age, gender, BMI and renal function-matched non-diabetic renal transplant recipients underwent a hyperglycemic clamp [fasting plasma glucose + 5 mmol/L] with concomitant glucagon like peptide 1 (GLP-1) or placebo infusions on alternate randomized occasions performed 2-4 weeks apart. 5 g arginine was injected over a 1 min period in the end of the hyperglycemic clamp condition. Blood samples of glucose, glucagon and insulin were drawn before and repeatedly throughout 180 min.

Results:
There were no significant differences in median (IQR) fasting concentrations of either glucagon (P=0.87) nor insulin (P=0.50) between the groups. The PTDM group had a significant lower glucose mediated glucagon suppression compared to the control group (Maximal suppression from baseline; 42 % (30-53 %) vs. 68 % (59-72 %), $P < 0.001$), parallel with a significant lower first phase insulin secretion as well as a lower capacity to increase insulin secretion from baseline to the end of the hyperglycemic clamp compared to control ($P < 0.001$). There were no differences in acute glucagon response to arginine between the groups, but the PTDM group had significant lower acute insulin response. Infusion of GLP-1 lead to a significant increase in first phase insulin secretion in both groups, but it remained significantly lower in the PTDM group.

Conclusions:
PTDM is a bihormonal disease with a combination of reduced insulin secretion and glucagon suppression during hyperglycemia. However, in contrast to patients with T2DM, the PTDM group did not exhibit fasting hyperglucagonemia. This might explain why renal transplant recipients with PTDM often exhibit isolated postprandial hyperglycemia.

#4217172

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Abstract topic Renal Replacement Therapy

Abstract title Phlebography and angiography of native arteriovenous fistulas in patients with chronic hemodialysis. A retrospective analysis.

Abstract text

Introduction:

The preferable mode of access in patients in chronic hemodialysis is a native distal arteriovenous fistula. This type of access is often complicated by stenosis and or thrombosis which increase the use of alternative accesses. Duplex sonography, phlebography and angiography are methods of choice when investigating and planning the corrective interventions in malfunctioning fistulas.

Methods:

A retrospective analysis was performed of 39 patients where 38 fistulographies and 16 angiographies and 10 PTA. A repeated evaluation of the intervention (PTA) procedure results was performed in nine cases.

Results:

15 fistulographies were normal. One angiography was normal Eight of these investigations led to operative corrective procedure Median degree of stenosis was 70 %. After PTA median stenosis rate was 40%.

Conclusions:

Preinvasive ultrasound investigation should more often determinate the mode of investigation in order to detect a stenosis or other cause of fistula dysfunction. PTA should preferably be performed together with angiography or fistulography if needed.

#4053914

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Abstract topic Chronic Kidney Disease

Abstract title Effect of Spironolactone on all-cause mortality in outpatients with chronic heart failure and impaired renal function.

Abstract text

Introduction:

Spironolactone is recommended as supplementary treatment in symptomatic patients with chronic heart failure (HF) with reduced left ventricle ejection fraction already treated with an inhibitor of the renin-angiotensin system (ACEi/ARB) and a ß-blocker. Despite its relative contraindication in patients with impaired renal function, spironolactone is prevalently used in Norwegian HF outpatients with impaired renal function and its use is associated with worsened renal function. Our aim was to address the safety of spironolactone treatment in HF outpatients with impaired renal function by assessing the effect of spironolactone on all-cause mortality in a propensity matched study.

Methods:

A total of 3102 patients with impaired renal function (eGFR < 60 ml/min/1.73 m2) from the Norwegian Heart Failure Registry were included. Propensity score, an estimation of individual probability of being treated with spironolactone based on 15 measured baseline characteristics, was calculated. Patients treated with spironolactone were then matched with untreated patients with similar propensity scores. Kaplan Meier and Cox regression analyses were used to investigate the independent effect of spironolactone treatment on 5-year all-cause mortality. Separate analyses were undertaken in strata of stages of chronic kidney disease, left ventricle ejection fraction and treatment with combination of RAS and ß-blocker prior to adding spironolactone and interactions checked by entering product terms into the Cox models.

Results:

Propensity score matching identified 710 pairs of HF patients with similar baseline characteristics. Five years after the last visit to HF clinic, 52.5% patients were alive in the spironolactone group and 53.2% patients in the non-spironolactone group. The use of spironolactone was not associated with 5-year all-cause mortality (HR 0.98, 95% CI 0.84-1.14). No interactions were identified for severity of renal dysfunction, left ventricle ejection fraction or prior use of ACEi/ARB and ß- blocker.

Conclusions:

The use of spironolactone was not associated with increased all-cause mortality in HF patients with impaired renal function.

#3820475

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Abstract topic Chronic Kidney Disease

Abstract title Two to three day biologic variation and concentration variations during hemodialysis of high sensitive Troponin T and Troponin I in patients with chronic kidney disease

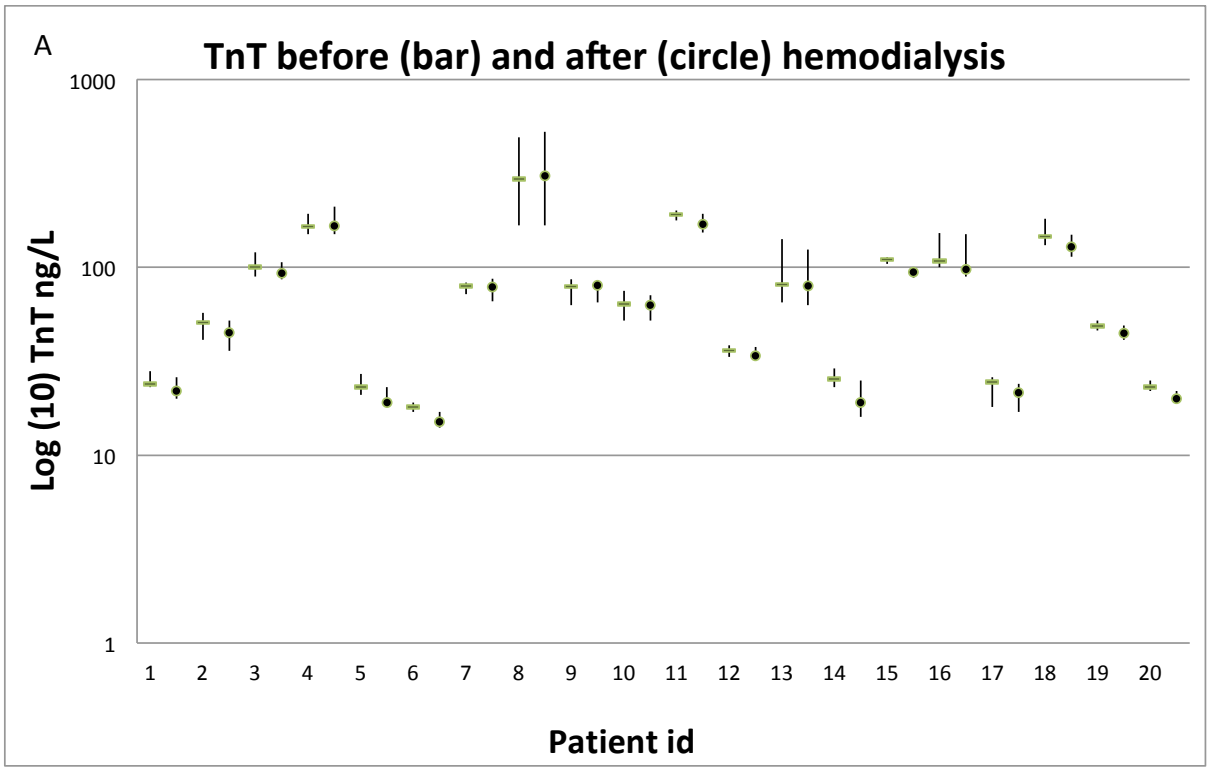
Abstract text

Background:
The aim of the study was to assess the two to three day analytical coefficient of variation (CVA), within - person biological variation (CVI), between – person biological variation (CVG), reference change value (RCV) and index of individuality (II) for two high sensitive troponin (hs-cTn) assays and to estimate the cTn concentration changes and variations in concentration changes in stable patients during hemodialysis (HD).

Methods:
Blood samples were collected before and after 10 concomitant HD treatments in 20 patients treated with high-flux HD on a two to three day interval. Serum samples were analyzed using the hs-cTnT assay from Roche Diagnostics and the hs-cTnI assay from Abbott Diagnostics. The two to three day CVA, CVI, CVG, RCV and II was estimated using nested ANOVA after ln transformation of the data. Variation during HD was estimated using original data after correcting for volume changes during HD.

Results:
Median hs-cTnT before HD was 61.5 ng/L (range 17.8-189.7). The CVA was 1.6% (95% confidence interval (CI) 1.4-1.9), the CVI was 7.3% (95%CI 6.6-8.4) and the CVG was 94.4% (95%CI 63.5-176.5). RCVpos was 23.0%, RCVneg was -18.7% and the II was 0.09. Median hs-cTnI before HD was 16.2 ng/L (range 4.1-113.2). The CVA , CVI, CVG, was 5.3% (95%CI 4.6-6.4), 13.2% (95%CI 11.7-15.3) and 142.4% (95%CI 96.0-408.5), respectively. The RCVpos was 48.2%, the RCVneg was -32.5% and the II was 0.13. After HD quite similar CV values were shown, however the mean concentrations of cTn decreased by -7.8 ng/L (hs-cTnI) and -2.3 ng/L (hs-cTnT). The within-person and between-person variation in cTn concentration changes during HD was 81% and 120% for hs-cTnT and 134% and 111% for hs-cTnI.

Conclusion:
The biological variation data is similar to earlier findings. Overall the cTn concentration decreases during high-flux HD, however there is a large variation in the magnitude of the changes. The within-person variation during HD was larger compared to the between-person variation. This means that an absolute cut off value (%) for pathological cTn changes during HD may be determined. cTnI show larger variation compared to cTnT for all investigated parameters.



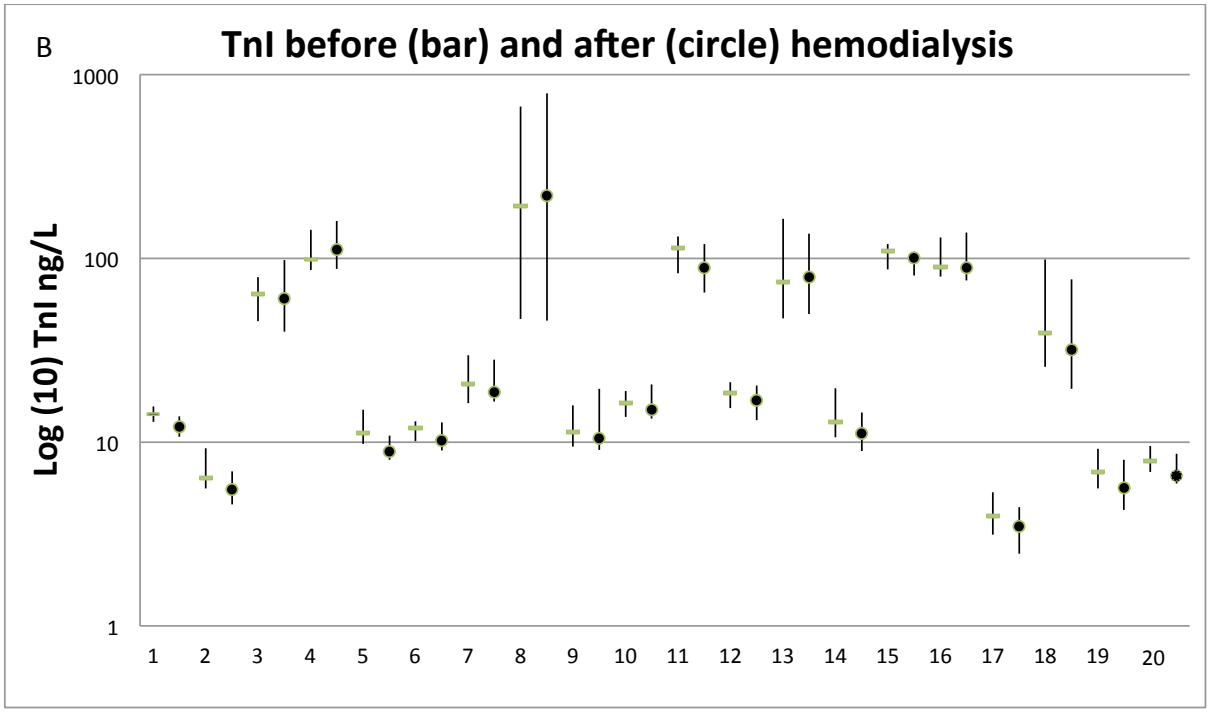


Figure 1. A) Range and median of hs-cTnT concentrations before (bar) and after (circle) 10 concomitant HD. B) Range and median of hs-cTnI concentrations before (bar) and after (circle) 10 concomitant HD. Patient id 8 with a clinical event also shown in the figure.

Abstract author Camilla Nilssen, Department of Nephrology, Oslo University Hospital, Ullevål, Oslo, Norway

Abstract title Renal amyloidosis in intravenous drug abusers.

Abstract text

Background:

Amyloidosis is caused by deposits of insoluble amyloid fibrils and may cause organ failure. Secondary amyloidosis (AA amyloidosis) is a potential complication of chronic inflammation/ infections. Renal failure due to secondary amyloidosis in intravenous drug abusers has previously been reported in small case series.

Material:

As of March 2015 a total of 99 patients were on maintenance hemodialysis at our ward in Oslo University Hospital, Ullevaal. Nineteen of them (19%) were current or past intravenous drug abusers. Mean age was 50,2 years, 14 male and 5 female.

Results:

All patients were HCV positive. Renal biopsy was performed in 14 of 19 patients (74%), AA-amyloidosis was confirmed in 13 of 14 (93%). All 19 patients have been intravenous drug abusers for an extended period of time. They all had recurrence of suppurative skin infections, and a high incidence of sepsis and endocarditis.

Conclusion:

Intravenous drug abusers account for a large proportion of an urban dialysis population and secondary amyloidosis is the main cause for renal failure.

Posters

The following abstracts are presented as they were submitted

#4223811

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Abstract topic Renal Replacement Therapy

Abstract title Symphony in real life -- low-targeted tacrolimus in de novo standard risk renal transplants

Abstract text

Introduction:

In renal transplant recipients, optimal tacrolimus concentrations at engraftment are not definitely established. Based on the results of the Symphony study, we have applied low-target tacrolimus (trough concentrations 3-7 µg/L) in de novo standard risk renal transplant recipients since 2009. The objective of this study was to evaluate outcomes with this strategy in a clinical setting as compared to the trial data of the Symphony study.

Methods:

A single-center study was conducted in standard risk renal transplant recipients, excluding immunized patients (DSA-positive, PRA>20% and ABO-incompatible) and HLA-identical transplants. Immunosuppression consisted of low-target tacrolimus, mycophenolate mofetil (1.5 g/day), low-dose prednisolone and basiliximab induction. One-year estimated renal function (Cockcroft-Gault), one-year biopsy-proven acute rejection rate and three-year graft- and patient survival were compared to the outcomes in the Symphony study.

Results:

From January 1. 2009 to March 31. 2013, we included 406 standard risk renal transplant recipients. In total 68% of the 15,772 tacrolimus concentrations were within the therapeutic window as defined by the Symphony protocol. One year after transplantation, the mean ±SD GFR was 76.8 ±28.3 mL/min (Symphony: 65.4 ±27.0 mL/min, P<0.001). Biopsy-proven acute rejections were seen in 14.5% of our patients (Symphony: 12.3%, P=0.35). Kaplan-Meier estimates [95% confidence interval] of three-year graft- and patient survival were 96.6% [94.2-99.0%] (Symphony: 93%) and 95.0% [92.6-97.3%] (Symphony: 95%), respectively.

Conclusion:

The current trend with high-target tacrolimus the early period after engraftment seems unnecessary. Initial low-target tacrolimus-based immunosuppression is as safe and effective in a clinical setting as reported in the original study trial.

#3109625

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Abstract topic Renal Replacement Therapy

Abstract title A retrospective analysis of HD-patients with native AV-fistula in a Swedish county hospital

Abstract text

Introduction:

Patients with hemodialysis treatment are dependent on a patent vascular access. According to guidelines the recommended first choice is a native AV-fistula (AVF). Complications such as thrombosis, stenosis and infection are well known. The patency varies pending on diagnosis, age, anatomy and medication. Recent years studies have shown worse outcome for diabetic women and elderly patients with expected limited survival. The primary aim of this study was to find any medical and/or laboratory differences that can predict AVF problems. We compared two groups with a native AVF.

Method:

Two Groups, A and B from our dialysis unit, with ten patients in each; Group A (n=10 patients): randomly chosen patients with patent native AVF without any intervention or suspected complication during the period of Jan 2013 until Dec 2014. Group B: 10 patients (15 episodes) with at least one or more examination/ intervention due to suspected AVF malfunction according to access protocol. Demographic, laboratory and on-going medication was recorded. One patient from each group was matched according to diagnosis and age. Two data episodes per control were compared with each one of AVF problem events (case-control mode 1:2). There was no difference in mean age (68 vs 66 years).

Results:

The Group B, at risk, had a higher weekly dose of ESA (erythropoesis stimulating agent) than Group A before intervention (mean 6500 $\pm$ 3300 U/w versus 2300 $\pm$2400, $p<0.001$) and also at the time after the intervention (7600 $\pm$ 4900, $p<0.001$). The hemoglobin values were lower in Group B (significant only at the follow up measurement, $p=0.018$). Female gender was significantly more associated with AVF malfunction than male ($p=0.03$). There was no significant difference in dose of low molecular weight heparine during hemodialysis, weekly st kT/v, platelets, parathyroid hormone, phosphate, albumin, C-reactive protein, smoking habits, diagnosis or other medication.

Conclusion:

Higher ESA doses and being a woman seems to increase the risk of AVF malfunction. Data do not exclude ESA associated AVF complications.

#4145061

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Abstract topic Other

Please describe other topic Bernd Stegmayr is responsible for the World Apheresis Association registry. Data have been evaluated in this abstract regarding adverse events in various types of apheresis.

Abstract title Adverse events in apheresis. Update analysis of WAA registry data.

Abstract text
Apheresis is used for a variety of indications with different procedures and devices. To increase safety it is important to know about side effects that may arise. This aim of this study was to clarify the extent of various side effects and the possible reasons for the cause of them based on data from the WAA-apheresis registry (www.waa-registry.org).

Materials and methods:
A total of 50167 procedures in 7142 patients (42% women) were included in the analyses. Data was retrieved during a period of 10 years, in total 29 centres from 14 countries. This is part of the safety assessment registry for apheresis approved by the ethical committee. Adverse events (AE) were graded as mild, moderate (need of medication), severe (interruption due to AE) or death (due to AE).

Results:
More AEs were present during the first apheresis (8.4 vs 5.5%). AEs were mild (2.4%; of these access- and device related 47 and 7%, hypotension 14%, tingeling in 7.5%. Moderate AEs were present in 3% (tingling 58%, urticarial 15%, hypotension 10%, nausea 3%), and severe in 0.4% (hypotension 31%, urticarial 16%, chills and fever 7%, tingling 5%). Of the 160 severe cases 6 had epilepsia, 5 had Quincke oedema, 5 bronchospasm, 2 asystolia, 2 anaphylaxia and 2 with gastrointestinal bleedings. One case suffered from TRALI (replaced with albumin). Hypotension were most common if albumin was used (48% if albumin only, 6 % if albumin and plasma, 12% if plasma only was used). In 30% of the patients with hypotension neither plasma or albumin was used. Urticaria seemed to be most related to the use of plasma (48%); if neither plasma or albumin was used only 4% had urticaria. Arrhythmia was not related to the use of albumin but to plasma or other used solutions. Bronchospasm or Quinke oedema was only reported if the treatment procedures contained plasma.

Conclusion:
Although severe adverse events are rare especially hypotension and arrhythmia may be critical for the patient. We suggest that safety is increased using regular blood pressure measurements, cardiac monitoring and an emergency equipment close in hands.

Caption file attachments:
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Croatian Republ.: Lalic K (Zagreb), Mazic S (Zagreb);
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Norway: Astrid Aandahl (Oslo);
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Portugal: Tomaz J (Coimbra);
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#4229340

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Co-authors Malin Skagerlind, PhD-student, RN, Public Health and Clinical Medicine, Umea University, Sweden

Abstract topic Renal Replacement Therapy

Abstract title Four different methods to reduce exposure to anticoagulation during HD.

Abstract text

Heparin is used to prevent clotting during haemodialysis (HD). For patients at risk of bleeding heparin has to be minimized. The aim of this study was to clarify the possibility to fulfil HD with any of four options, (without a bolus of heparin at start): a priming solution that is wasted of either heparin in saline (HS), heparin and albumin in saline (HA), HA in combination with citrate in the dialysate (HAC), heparin coated filter (Evodial®, Gambro).

Method:

25 chronic HD-patients (single centre) were enrolled in the study (17 men, 8 women). The patients were their own controls (paired statistics); first randomized to HS versus HA and the second block HAC versus Evodial. The Ethical committee and the Swedish Medical Product Agency approved the study. Access was AV fistula (n=12), central dialysis catheter (n=12) and femoral vein catheter (n=1). Blood samples were collected at 0, 30 and 180 minutes during HD. Dialyzer clotting was graded: 0=none, 1=mild-medium, 2=severe and 3=extensive clotting causing interruption of HD. Small heparin doses were allowed during HD.

Results:

More HS treatments were interrupted compared to standard HD ($p<0.001$, Fishers' test, Table). The mean Activated Partial Thromboplastin-time (APT, ref 22-37 sec) at 30 and 180 minutes was with standard HD 98 vs. 48 (sec). APT at 30 and 180 minutes did not differ between the other methods (H-priming: 39 versus 38; HA: 35 vs. 32; HAC: 36 vs. 31; Evodial: 32 vs. 31). Urea-Reduction-Rate was less with Evodial at 30 and 180 min versus standard HD (23 versus 27% and 58 vs. 63%, $p<0.05$). Additional heparin doses were at a mean 184 (HAC and Evodial), 413 (HA), 642 (H) versus 4400 Units tinzaparin for Standard HD.

Conclusion:

The study indicates that heparin priming is least suitable. The Urea-Reduction-Rate was least with Evodial. Individual and local experiences have to be considered.

Caption file attachments:

Table

Table: Percentage of dialyzer condition. *p<0.001, Relative risk >8 vrs standard

Clotting: Anticoagulation	Clean	Mild-medium	Moderate	Interrupted	Total N
Standard	78	22	0	0	23
H-priming	33	24	10	33*	21
HA-priming	9	48	30	13	23
HAC	5	47	42	5	19
Evodial	37	47	11	5	19
Total	33	35	13	11	105

#3576278

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Co-authors:	Anne Simmons, Head of Mechanical and Manufacturing Engineering, University of New South Wales Tracie Barber, Senior Lecturer in the School of Mechanical and Manufacturing Engineering, University of New South Wales

Abstract topic	Other
Please describe other topic	Haemodialysis
Abstract title	Optimal Placement of the Arterial and Venous Needle in a Radio-Cephalic Fistula

Abstract text

Introduction:

Vascular access is critical in achieving efficient blood filtration for haemodialysis. A common obstacle in cannulation of arteriovenous fistulae is the placement of the arterial and venous needle such that recirculation is minimised and the integrity of the anastomosis is not compromised through repetitive puncture. This can be difficult if the cannulation segment is not sufficiently long to easily accommodate both needles. This study aims to determine an optimum separation distance between the anastomosis and the arterial and venous needles to minimise access recirculation.

Methods:

Transient computational fluid dynamic simulations were conducted on a healthy end to side radio-cephalic fistula. Needle flow rates of 200 ml/min, 300 ml/min and 400 ml/min were imposed on the needles, where were positioned in an antegrade orientation. The needles were inserted at an angle of 20° with the bore centrally located within the vein. Needle separation distances of 3cm, 5cm and 7cm were analysed.

Results:

The flow through the anastomosis of an end-side radio-cephalic fistula produces a faster flow bias on the outer wall due to the curvature of the vessels. Swirling flow produced at the anastomosis of the fistula has significantly dissipated at the start of the cannulation segment. The region of flow entering the arterial needle is small and located only around the needle bevel. The venous needle produces jet like characteristics with pronounced swirling flow extending far downstream in the cephalic vein. Separation distances were optimised based on the flow found in the fistula.

Conclusions:

From a haemodynamic perspective, these results indicate that the arterial and venous needle can be placed in close proximity to each other in a healthy fistula without producing an increase in access recirculation. Furthermore, the arterial needle should be placed within the cannulation segment, away from the anastomosis, to minimise the effects of swirling flow produced in the fistula.

#4225513

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Abstract topic Chronic Kidney Disease

Abstract title Complete resolution of calciphylxis after kidney transplantation

Abstract text
Introduction:
Calcific uremic arteriolopathy (CUA) is rare, occurs most often among patients in dialysis and causes ischemia, subcutaneous necrosis and potentially death. The current treatment is a multi-intervention approach. The impact of kidney transplantation (KTX) on recovery is not well known. We present two cases with calciphylaxis with transplant related complete resolution.
Results:
Patient 1 had Crohn's disease and secondary amyloidosis with kidney failure. His first KTX from 1991 failed in April 2013 due to recurrence of amyloidosis. He was at this time treated with warfarin due to pulmonary embolism. Severe pain and ulceration evolved in both legs from August 2013, CUA was suspected. Warfarin was replaced by LMWH and medical therapy was given without results. He was put on a clinical urgent list for KTX in September 2013 and received his second KTX 4 weeks after. 6 weeks post- transplantation the skin lesions were completely healed. Patient 2: 62-year-old male with end- stage renal disease (ESRD) due to nephrosclerosis who had his second KTX at the age of 61. The transplant function was poor and he was reestablished on hemodialysis after 1 year. A few weeks later he presented with painful lower limb skin ulcers. Skin biopsi confirmed calciphylaxis. We had a multidiciplinary approach with careful wound management. He never used warfarin. It was not until his 3. kidney transplantation in 2015, as clinical urgent, that the lesions resolved fast and completely within 6 weeks.
Conclusions:
These two cases may indicate that urgent KTX is an efficient treatment for patients with ESRD and CUA.

#4010498

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Abstract topic Other

Please describe other topic Hemodialysis, Airtraps, Airbubbles in hemodialysis

Abstract title Microbubbles in Haemodialysis: an analysis on the performance of the air trap

Abstract text

Due to the chronic nature of the haemodialysis (HD) treatment, minor imperfections in the extracorporeal system may cause significant consequences over time. Clinical studies have highlighted the possibility of small microbubbles travelling through the HD device to the patient. These bubbles lead to further pathophysiological complications (primarily seen in the lungs and brain). Microbubbles of different sizes can be generated throughout the extracorporeal HD circuit and the size of the bubble is a major factor in the type of complications affecting the patient. The performance of the air trap; the only mechanism for removing air bubbles, is therefore critical. Chronic exposure to various sizes of microbubbles was analysed in detail and the performance of the haemodialysis air trap has been evaluated. Our results show that bubbles larger than 0.5mm in diameter are likely to be removed by the air trap, however some of the smaller microbubbles are shown to pass through and enter the bloodstream. While the presence of various bubble sizes before and after the air trap have been investigated in previous studies, these bubbles were only counted and not tracked. The performance of the air trap for removing different bubble sizes is not understood. Here, the performance of the air trap in filtering bubbles and the possibility of different bubble sizes passing through the air trap has been evaluated. The modelled air trap is shown to be ineffective for filtering small micro bubbles.

#3949976

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Abstract topic Chronic Kidney Disease

Abstract title Association of body composition and estimated GFR in elderly males and females

Abstract text

Introduction:

Changes in body composition (BC) and kidney function are commonly seen with aging. Limited data is published on the association of kidney function and BC in the elderly. The goal of the study was to determine if there was an association between BC, muscle strength and estimates of kidney function in elderly males (M) and females (F).

Methods:

The data were obtained from the population-based Age, Gene/Environment Susceptibility - Reykjavik Study. A total of 940 (421 M and 519 F) of the 5764 participants had complete data for GFR estimates (eGFR) using the creatinine - cystatin C-based CKD-EPI equation. Creatinine and cystatin C assays were traceable to standardized reference materials. Body mass index (BMI, kg/m2) was calculated from height and weight. Abdominal circumference (AC) was measured using standardized protocols, fat percentage (FP) by bio-electrical impedance and leg muscle strength (LMS) during extension. Descriptive statistics and linear regression adjusted for age, hypertension (HTN), diabetes (DM) and smoking were performed.

Results:

All participants were white and 55% were F. The mean (SD) age was 76 (4) years, eGFR 74 (17) ml/min/1.73 m2, 81% had HTN, 10% DM and 13% smoked. Mean LMS and BC measures and their change associated with 10 ml/min/1.73m2 lower eGFR for M and F are shown in table. A significant interaction with sex was found for the association of eGFR with BMI, FP and AC.

Conclusions:

Measures of BC are associated with eGFR in older adults but the direction of this relationship may be different for men and women. These findings may reflect confounding by non-GFR determinants of serum creatinine and cystatin C and need to be confirmed using measured GFR.

Caption file attachments:

Table. Estimated difference in strength and body composition per 10 ml/min/1.73 m2 lower eGFR in males and females.

	n	Mean (SD)	M	F	Beta M *vs.* F
			Beta ± SE	Beta ± SE	
LMS (kg)	**889**	**33 (11)**	**-0.39 ± 0.30**	**-0.39 ± 0.21**	
BMI (kg/m^2)	**939**	**27 (4)**	**-0.16 ± 0.11**	**0.51 ± 0.12∇**	∇∇
Fat (%)	**587**	**29 (8)**	**-0.60 ± 0.21****	**0.58 ± 0.15∇**	∇∇
AC (cm)	**939**	**100 (11)**	**-0.13 ± 0.29**	**1.41 ± 0.33***	∇

*p<0.01, **p<0.005, ∇p<0.0005, ∇∇p<0.0001

#3747885

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Abstract topic Other

Please describe other topic Comparing levels of the new biomarkers NGAL, Klotho and FGF23 in kidney donors with normal kidney function, patients with CKD stages 3-5, and a healthy control population.

Abstract title Biomarkers in kidney donors with normal kidney function, in patients with chronic kidney disease, and in a healthy control population.

Abstract text

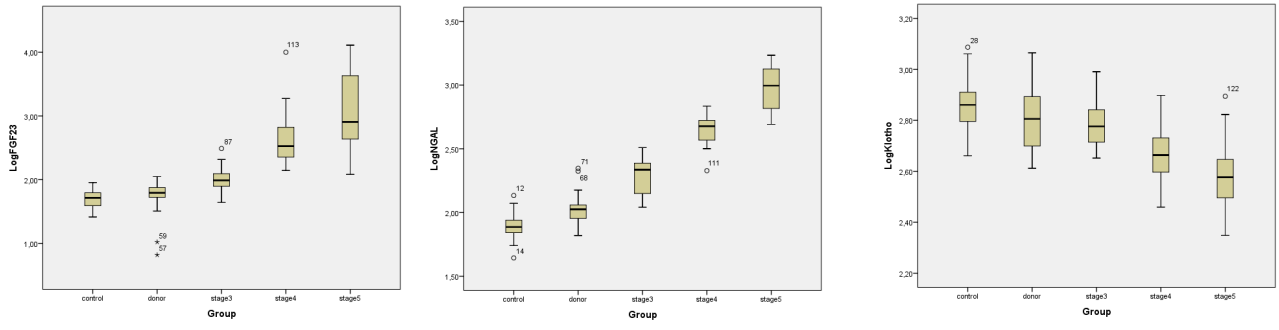
Introduction:
Chronic kidney disease (CKD) is common. The best treatment for end stage renal disease is kidney transplantation. Twenty-seven percent of transplantations in Norway are from living donors. Recent studies have showed increased risk of developing ESRD and increased mortality in kidney donors. The aim of this study was to determine if increased morbidity is associated with disturbances in the new biomarkers neutrophil gelatinase-associated lipocalcin (NGAL), Klotho and fibroblast growth factor 23 (FGF23) in kidney donors with normal kidney function, compared to patients with CKD stages 3-5, and a healthy control population.

Methods:
This cross-sectional, observational single-center study included 40 kidney donors with an eGFR ≥ 60ml/min/1.73m2, 22 patients with CKD stage 3 (eGFR 30-59 ml/min/1.73m2), 18 patients with CKD stage 4 (eGFR 15-29 ml/min/1.73m2), 20 patients with CKD stage 5 (eGFR < 15 ml/min/1.73m2) and thirty-five healthy controls.

Results:
The levels of log NGAL were significantly higher in donors compared to healthy controls, 1.89 ± 0.10 vs 2.03 ± 0.11, and the levels increased with declining kidney function. Log FGF23 levels were non-significantly higher in donors compared to controls, 1.69 ± 0.14 vs 1.75 ± 0.22, but the levels significantly increased with declining kidney function. There was no difference between log Klotho levels in controls and kidney donors, 2.86 ± 0.98 vs 2.80 ± 0.12, but the levels were significantly lower in CKD stages 4 and 5 than in controls.

Conclusion:
Kidney donors have significantly higher levels of NGAL than healthy controls. This may reflect a partial renal loss-of-function in kidney donors compared with the control group. This could be associated with renal hyperfiltration and a state of ongoing cellular stress after kidney donation. NGAL could be a valuable marker for early prediction of the development of CKD and increased mortality in donors.

Boxplots showing distribution of LogNGAL, LogKlotho and Log FGF23 in the different subgroups:



#3744079

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Abstract topic Acute Kidney Injury

Abstract title Smoking is associated with aggravated acute kidney injury (AKI) in Puumala hantavirus induced hemorrhagic fever with renal syndrome

Abstract text

Introduction:

In Finland 1000-3000 cases of Puumala virus (PUUV) induced nephropathia epidemica (NE) are yearly serologically diagnosed. Plenty of cases occur in Sweden and fewer in Norway. PUUV is carried by the bank vole (Myodes glareolus) and transmission of PUUV to humans occurs by inhalation of aerosols from infected rodents. The main manifestations of NE are fever, acute kidney injury (AKI), thrombocytopenia and increased capillary leakage. Previous studies indicate that smoking affects the outcome of some infections and is a risk factor for PUUV infection. The aim of the present study was to access the effect of smoking on the clinical severity of NE. The prevalence of smoking was also studied in a large cohort of NE patients.

Methods:

A questionnaire on smoking habits was sent in 2012 to 494 patients who had been treated in Tampere University Hospital during the years 1982 to 2012 for serologically confirmed PUUV infection. The status of current and previous smoking at the time of getting ill in NE was investigated. Current smokers were defined as smokers, ex-smokers and never-smokers as non-smokers.

Results:

Of all patients, 375 (72%) participated the survey (M257/F100, mean age 41.3 years at the time of NE). Maximum plasma creatinine was significantly higher in current smokers than in non-smokers (median 273 vs. 184 µmol/l, $p<0.001$) and they also had higher maximum blood leukocyte count (10.8 vs. 8.9x109/l, $p<0.001$). The maximum creatinine was not different in the subgroups of never-smokers and ex-smokers. Altogether 51% the patients were current smokers. At the time of the study about 25% of Finnish people smoked.

Conclusions:

Hospital-treated patients with acute PUUV infection smoke clearly more often than the average population in Finland. Current smokers suffer from more severe AKI and have higher leukocytosis than non-smokers. Smoking cessation decreases the risk of severe AKI to the same level as observed in never-smokers. Smoking leads to structural and functional changes in the respiratory tract and in the endothelium as well as to activation of inflammatory mediators, which are probably involved in the pathogenesis of the findings.

#3774347

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Abstract topic Acute Kidney Injury

Abstract title Unplanned start of PD. A single center experience in Turku, Finland.

Abstract text

Introduction:

The default dialysis treatment modality for late referred patients, the crash landers, in most centers worlwide is hemodialysis with a central catheter. Transfer to home dialysis rarely happen after this. Unplanned start with hemodialysis is associated with infectious complications and excess mortality. In order to restrain the number of late referred (and others with AKI) patients ending up in chronic hemodialysis we started performing acute peritoneal dialysis (aPD) as first dialysis treatment modality to these patients.

Methods:

During 10 years (2005-2014) 40 patients started acute PD in our center. We used the same treatment prescription described earlier by Povlsen and Iversen (NDT 2008; xx: xx).

#4231506

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Abstract topic Other

Please describe other topic Opportunistic infection in kidney transplant recipients

Abstract title Pneumocystis Jirovecii Pneumonia cluster in kidney transplant patients at Oslo University Hospital, Ullevål.

Abstract text

Introduction:

Pneumocystis Jirovecii Pneumonia (PCP) is a significant opportunistic fungal infection in solid organ transplant recipients. The insidence of PCP was previously 5-15% in solid organ transplant recipients during the first 6 months after transplantation, in kidney recipients in the lower part of the range. This number was reduced by 91% after the introduction of generalized trimethoprim-sulfamethoxazole profylaxis.

Methods:

During three winter months in Oslo University Hospital,Ullevål, three of our 340 kidney transplant recipients were diagnosed with PCP. Their characteristics and treatment is presented and compared to similar findings reported in the literature.

Results:

Three kidney transplant recipients aged 66-71 years had increasing dyspnoe and fatigue in 1-2 weeks prior to admittance. They had low-grade infection parameters and normal or reticulonodular chest x-ray findings. CT scans showed mosaic attenuations and ground glass opacities. All three patients had and a low lymfocyte count and two of them had elevated levels of lactate dehydrogenase which is found to be typical in studies. The diagnosis was based on a positive microscopy or a moderate PCR burden of Pneumocystis Jirovecii in bronchoalveolar lavage fluid. Our patients were in the second, fourth and ninth year after transplantation and received immunosuppressive regimens of respectively CsA+MPA+S, Tac+MPA+S and CsA+MPA+S+mTORi. Two of the patients had positive CMV serologies before transplantation and both received CMV positive diseased donor kidneys. One of the patients had a negative CMV serology before transplantation and received a CMV negative diseased donor kidney. None of our patients had CMV disease during the last year before PCP. They were treated with trimethoprim-sulfamethoxazole and supportive oxygen therapy, two of the patients partly in the ICU. All three of our patients survived.

Conclusions:

PCP is still regularily appearing in the kidney transplant recipient population and should be considered in patients with dyspnoe and hypoxia. Further investigation and discussion is needed to adress the need of extended PCP prophylaxis.

#4203963

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Abstract topic Renal Replacement Therapy

Abstract title The effect of selenium deficiency on thyroid hormone and cardiovascular diseases in hemodialysis patients

Abstract text

Introduction:

Trace element, selenium deficiency is known to associate with impairment of thyroid hormone and cardiovascular diseases such as coronary artery disease, cardiomyopathy or sudden death. In hemodialysis (HD) patients, various causes may contribute to selenium deficiency, including decreased dietary intake, malabsorption, alteration of metabolism, and removal through dialysis itself. Therefore, we tried to investigate the effect of selenium deficiency on thyroid hormone and cardiovascular diseases in HD patients

Methods:

This cross-sectional study enrolled 83 end-stage renal disease patients who underwent HD in Jeju National University Hospital. The patients were divided into two groups based on serum selenium levels: 62 patients were normal level and 22 patients were selenium deficient. Thyroid hormones such as TSH, free T4 were measured. And presence of cardiovascular diseases, including ischemic heart disease (IHD), heart failure or cardiomyopathy were evaluated.

Results:

There were no significant differences in baseline characteristics including age, sex, presence of diabetes mellitus, hypertension medication between the two groups. Thyroid hormone impairment, including hypothyroidism and subclinical hypothyroidism showed higher tendency in selenium deficient group than that in non- selenium deficient group. (27 % vs 10 % P=0.06) The prevalence of ischemic heart disease was significantly higher in selenium deficient group than that in the non-selenium deficient group. (59% vs 21 %, p=0.04) But there was no difference in heart failure defined as ejection fraction with below 40%, and cardiomyopathy between the two groups. All patients with thyroid hormone impairment showed high prevalence of IHD and the coincidence of thyroid impairment and IHD was significantly higher than that in selenium deficient group than that in non-selenium deficient group. (18% vs 4% , p=0.014)

Conclusion:

This study showed the significant high prevalence of thyroid hormone impairment and IHD in HD patients with selenium deficiency. Selenium deficiency may be affect the heart disease, associating with thyroid hormone impairment

#2731961

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Abstract topic Chronic Kidney Disease

Abstract title Health related quality of life (HRQOL) in older patients waiting for kidney transplantation in Norway

Abstract text

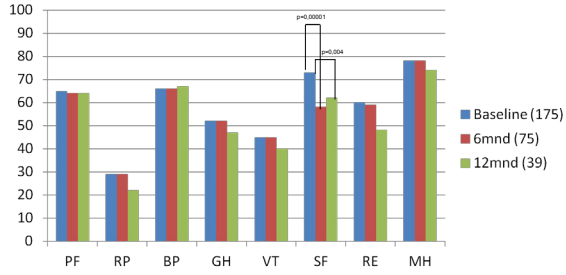
Introduction:
There is a lack of studies measuring HRQOL in older recipients enlisted for kidney transplantation (KTx). The aim of this study was to measure HRQOL changes longitudinally in patients >65 years of age; from time of enlisting (baseline) until KTx.

Methods:
Patients >65 years listed for transplantation at Oslo University Hospital were asked to complete the SF36 questionnaire when accepted for the waiting list and thereafter every 6th months until transplantation (or being permanent removed from the transplant list).

Results:
A total of 180 patients have been included from Jan 2013. Mean age at baseline was 70.6 years (65.0-81.8) and 68.3 % were male. Valid baseline SF36 forms were available for 175 patients. By May 15th 2015 a total of 100 patients were transplanted. Sixty-two patients were transplanted within 6 months of enlisting (i.e. baseline values only), Seventy-five patients fulfilled the baseline + 6 months and thirty-nine the baseline + 12 months questionnaires When comparing the entire enlisted group with the age-matched Norwegian population (Nor group) there were no differences in SF36 scores at baseline. The overall mean score for social function at both 6 and 12 months was significantly decreased when compared with score at baseline (Figure 1) and when compared to the Nor group. Enlisted females had significant lower vitality scores compared to enlisted males at baseline and at 1 year (38 versus 48). Females also had significant lower mean physical function score than males at baseline (59 versus 67). The difference was still present at 6 and 12 months, but not statistical significant. These gender differences are comparable with the reported differences in the age matched Norwegian population.

Conclusion:
Our preliminary findings indicate that older patients enlisted for KTx have no significant decrease in HRQOL during first year on the waiting list except for social function. HRQOL in this selected group of older patients qualified for enlisting is comparable with data from the Norwegian normal population.

Figure 1: HRQoL in all patients in DIA-arm, measured with SF36*



*Mean scores

#4224941

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Abstract topic Renal Replacement Therapy

Abstract title Old, older…. octogenarian – still candidate for renal transplantation?

Abstract text

Introduction:

Increasing age leads to increased comorbidity. We have previously shown that patients older than 70 years with end stage renal disease (ESRD) have a survival benefit if transplanted compared to continued dialysis. Is this also true for selected patients reaching their eighties? Material and

Methods:

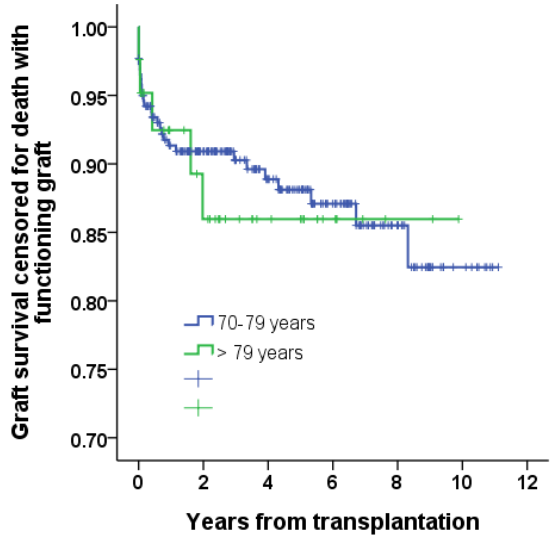
All patients older than 79 years at engraftment, transplanted at Oslo University Hospital between 1983 and 2015 were included in the study. Data were retrieved from the Norwegian Renal Registry end of May 2015. Survival analyses were performed using the Kaplan-Meier method as well as Cox regression models. Survival was compared to a previously collected dataset of patients aged 70-79 years transplanted between 2000 and 2010.

Results:

46 patients older than 79 years were transplanted in the defined period. Mean age was 80.4 years (79.1-82.5) and 80 % were male. Mean time on dialysis prior to transplantation was 20 months (range 0-54), all received an allograft from a deceased donor (mean age 60.5 years, range 18-85). In the death censored graft survival model, there where no statistical difference between the groups (figure 1). Median uncensored graft survival was 4.3 years (95% CI 1.2-7.0). Median patient survival was 4.7 years (2.8-6.6) and five year patient survival was 47%. The Cox regression model for patient survival revealed an increased risk of death among patients transplanted before 2000; HR 2.9 (95% CI 1.0-8.3). Recipient age, recipient gender, donor age and time on dialysis were tested in the same model, none of these were associated to patient survival. A separate Kaplan-Meier analysis revealed a median patient survival of 2.5 years (0.0-5.5) for patients transplanted before 2000 (n=12) versus 5.0 years (3.1-6.9) for patients transplanted after 2000.

Conclusion:

Age by itself should not be an absolute contraindication against renal transplantation. An estimated five year survival rate of 47% for an 80 year old patient with ESRD is in our opinion more than acceptable.



#4192715

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Abstract topic Other

Please describe other topic Basic Methodology

Abstract title Evaluation of RNA Extraction Kits to Enable RNA Sequencing of Archival Renal Tissue

Abstract text

Introduction:

RNA sequencing, such as next generation sequencing (NGS), is gaining importance to acquire insights into molecular disease mechanisms. Therefore, it is of interest to optimize methods for RNA extraction from archival, formalin fixed and paraffin embedded (FFPE) tissues. Extraction of RNA from FFPE tissues is challenging because of RNA fragmentation and degradation as well as of formalin triggered chemical RNA modification. The aim of this study consists in the evaluation of the most appropriate method to extract RNA from FFPE rat renal tissue using both whole tissue sections and laser capture microdissection (LCM) of glomeruli. Yield, purity and quality of RNA were assessed.

Method:

We evaluated six commonly used RNA extraction kits, such as High-Pure FFPE-Tissue RNA Isolation Kit (Roche), ExpressArt Clear FFPE RNAready (Amsbio), miRNeasy FFPE (Qiagen), Purelink FFPE Total RNA Isolation Kit (Invitrogen), RecoverAll Total Nucleic Acid Isolation Kit (Ambion) and Absolutely RNA FFPE Kit (Agilent). RNA was obtained from approx. 3.5 years old FFPE tissue blocks (n= 2 per animal) of two healthy, male Wistar rats. RNA concentration was measured by a Qubit 2.0 Fluorometer® for whole sections and by an Agilent 2100 Bioanalyser® for LCM glomeruli. A NanoDrop® ND-1000 was used to measure RNA purity as indicated by the 260/280 ratio. RNA quality is reflected by the DV200 values (% of RNA fragments >200 nucleotides) utilizing also the Agilent 2100 Bioanalyser. For each RNA extraction kit, a total 12 measurements were performed as follows: i) 8 analyses (1.5 sections per analysis) in the case of 10µm whole sections and ii) 4 analyses in the case of LCM glomeruli (80-101 glomeruli per analysis). LCM glomeruli were obtained also from 10µm tissue sections.

Results:

Results of quantity, purity and quality of the extracted RNA are presented in Table 1.

Conclusion:

Total RNA of sufficient amounts and quality (e.g. 20ng with DV200 >70% or >20ng with DV200 of 50-70%) can be obtained from one whole tissue section as well as from approximately 100-250 LCM glomerular cross sections to safely perform NGS using three of the six tested kits.

Table 1	No of analyses: Sections (LCM)	RNA per section in ng (mean)	RNA per 100 glomeruli in ng (mean)	Purity: 260/280 (mean)*		Degradation: DV200 % (mean)**	
				Sections	LCM	Sections	LCM
High Pure FFPE (Roche)	8 (4)	465	18	1.8	1.2	72	84
miRNeasy FFPE (Qiagen)	8 (4)	538	25	1.7	1.4	45	25
ExpressArt Clear FFPE RNAready (Amsbio)	8 (4)	241	9	1.8	1.7	62	52
Purelink FFPE Total RNA (Invitrogen)	8 (4)	227	4	1.9	1.8	69	45
RecoverAll Total Nucleic Acid (Ambion)	8 (4)	130	1	2.1	2.3	67	45
Absolutely RNA FFPE (Agilent)	8 (4)	below detection limit		1.7	1.9	55	56

*Purity: A ration between 1.8 and 2.2 is accepted as "pure" for RNA

** Degradation: DV200 >70% = high quality, 50-70% = medium quality, 30-50% =low quality, <30% = degradated

#4225004

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Abstract topic	Other
Please describe other topic	Complications after kidney transplantation / post-transplant diabetes mellitus / Obesity in kidney-transplant recipients
Abstract title	Evolution of glucose tolerance and visceral fat during the first year after kidney transplantation

Abstract text

Introduction:

Obesity is associated with potentially poor outcome after kidney transplantation. Visceral fat is considered a key mediator of adverse effects linked to obesity. Evolution of body composition including visceral fat (VAT) and glucose tolerance after kidney transplantation has not been previously examined.

Methods:

We studied 150 kidney-transplant recipients without diabetes in a stable phase 10 weeks post-transplant and subsequently at 1-year post-transplant using a standard oral glucose tolerance test and a DXA scan assessment of body composition including VAT measures using DXA Lunar Prodigy, software version 14.10.

Results:

At one year body weight had increased by a median of 1.5kg ($p<0.001$), BMI by 0.5 ($p<0.001$), and total body fat by 1.8kg ($p<0.001$). Total lean mass remained unchanged (median +0.2kg, $p=0.157$) as did also VAT (median absolute amount +0.06kg, $p=0.127$, median percentage VAT of total body fat -0.1%, $p=0.243$). At baseline 51% had normal glucose tolerance, 17% impaired fasting glucose, 19% impaired glucose tolerance, and 13% post-transplant diabetes. At one year glucose tolerance was normalized in 13%, improved in 11%, exacerbated in 13% and remained unchanged in 63%. Patients who deteriorated to a poorer glucose tolerance group had significantly higher BMI and more visceral fat both at baseline and follow-up than those who remained as normal glucose tolerance ($p<0.05$ for all differences between groups). The changes during the first year in these and the other body composition measures were not significantly different among the groups.

Conclusion:

Body weight, BMI and total body fat mass increased significantly, while visceral fat parameters and lean body mass remained unchanged during the first year post-transplant. The prevalence of glucose intolerance also remained essentially unchanged. The data suggest that visceral fat is less influenced by nutritional factors and increments in body weight than BMI and total body fat.

#3008641

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Abstract topic Other

Please describe other topic Hyponatremia

Abstract title Hyponatremia in a department of general internal medicine. Prevalence and causes.

Abstract text

Introduction:

Hyponatremia is the most common electrolyte disorder in hospital. It is potentially life threatening, but even milder forms lead to increased morbidity, longer hospital stays and more frequent readmissions. The aim of this study was to register prevalence and causes of hyponatremia in our department.

Methods:

The present retrospective study was performed in Dept of General internal medicine, Oslo university hospital, Ullevål. All patients with hyponatremia on admission during the period June 2012 until June 2013 were enrolled in the study. Age, sex and current medication was registered, as well as relevant blood tests and urine electrolytes and osmolality. Chest x-rays were studied for signs of overhydration. Patient journals and medical reports were scrutinized for the physisian's evaluation of volume status, possible SIADH and probable causes of hyponatremia. In the abscence of such evaluation, the investigator's own opinion on probable causes was registered, based on volume status, medical history, urine sodium/osmolality if available and medication. The cause of hospitalization was noted as well as the main diagnosis at discharge.

Results:

There were 1118 unique patients hospitalized in our department in the period (1272 hospital stays). There were 55.5% females, the mean age was 73 years. In 59 patients (5.27%), hyponatremia was present at the time of admittance, 4 had profound (Na <120), 27 moderate (Na 120–129) and 28 patients mild (130–134) hyponatremia. Nine patients were hypervolemic, 3 hypovolumic, and 45 euvolemic on admission. The possible causes of hyponatremia are listed in Table I.
In 50.8% there were 2 or more potential causes of hyponatremia. In 3 patients there was no obvious explanation for the hyponatremia. Seven patients were diagnosed with SIADH. However, urine sodium and urine osmolality was analyzed in only 16 patients.

Conclusions:

The prevalence of hyponatremia in our department was 5.27%. Of these, 11.8% had SIADH. A combination of 2 or more probable reasons for the development of hyponatremia was found in 50.8% of the patients.

Table I

Probable and possible etiology of hyponatremia

Thiazide diuretic	12
Other various medication	64
Hypervolemia (cardiac or kidney failure)	11
Malignant disease	11
Pulmonary disease	5
Alcohol abuse	11
Hyperglycemia	4
Mb Addison	1

#3807258

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Co-authors Kim So Mi, M.D, Division of nephrology, Department of Internal medicine

Abstract topic Renal Replacement Therapy

Abstract title Response rate of HBV vaccination in various stages of chronic kidney disease

Abstract text

Introduction:

Although hepatitis B virus (HBV) vaccination is recommended for all dialysis patients, the response rate of HBV vaccination in dialysis patients is very low. Therefore, we tried to investigate the necessity of early HBV vaccination in pre-dialysis patients analyzing the response rate of vaccination in various stages of chronic kidney disease (CKD).

Methods:

A total of 87 patients in 3 different stages of CKD was enrolled in this study. Patients in stage 3 (n=30) and 4 (n=28) were received the HBV vaccine as standardized schedule, consisting of 1 mL of the recombinant vaccine, Hepavax-gene TF at 0, 1, and 6 months. And then, the patients with stage 5 (n=29) were received the same vaccine for doubling doses at 0, 1, 2, 6 months. Three months after each of the last vaccination, serum level of Anti-HBs was measured in all patients.

Results:

There was no significant difference in baseline characteristics including age, sex, presence of DM among the 3 groups. The overall seroconversion rate after vaccination was 79.4 %. The seroconversion rate was significantly higher in patients with stage 3 than other patients (stage 3 : 94%, stage 4 : 79%, stage 5: 66%, p=0.031). Analyzing based on dialysis, seroconversion rate was also significantly higher in pre-dialysis patients than that in dialysis patients (pre-dialysis group : 86%, dialysis group: 63%, p=0.02). There was no significant factor to contribute seroconversion in multivariate analysis.

Conculsions:

Our study showed the high seroconversion rate after HBV vaccination in CKD patients with stage 3 and pre-dialysis. Therefore, the HBV vaccination should be considered in early CKD stages.

#4168054

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Abstract topic Chronic Kidney Disease

Abstract title Stenosis diameter predicts outcome after intervention for renal artery stenosis

Abstract text
Introduction:
Renovascular disease is increasingly recognised as a cause of renal impairment but the role of endovascular intervention in this setting is unclear. Recent multi-centre trials have established that revascularisation does not improve renal prognosis in the average patient, but many clinicians believe that there is a subgroup of patients who benefit.
Methods:
In this retrospective single-centre cohort study we included all patients who had renal angioplasty during a 2 year period for whom 12 month follow-up data were available. Patient outcomes were defined according to change in creatinine in the 3 years post intervention, with ordinal outcome scores assigned: 1= improved by 20umol/l; 2= no change; 3= declined by 20-100umol/l; 4= declined by more than 100umol/l, died or started dialysis during follow-up.
Results:
Sixty-two patients (aged 51-85, 74% male) underwent angioplasty which was bilateral or to a single functioning kidney in 33% of cases. Outcome scores 1 to 4 were seen in 12.9, 43.5, 24.2 and 19.4% of patients. Absolute stenosis diameter increased across outcome group (mean 1.2, 2.2, 2.4 and 2.4mm) with stenosis diameter significantly correlated with outcome group ($R=0.324$, $p=0.010$). Percentage stenosis diameter was not related to outcome. Outcome score 1 was seen in 24% of patients with diameter less than 2mm, and only 5% of patients with diameter over 2mm ($p=0.067$).
Conclusion:
Heterogeneity of outcome can be expected after intervention for renal artery stenosis. Patients benefitting from the procedure have tighter absolute stenosis diameter.

#4099213

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Abstract topic Hypertension

Abstract title The effects of empagliflozin on blood pressure and markers of arterial stiffness and vascular resistance by subgroups of age, sex and degree of hypertension in type 2 diabetes

Abstract text

Introduction:

Empagliflozin improves glycemia and reduces weight, blood pressure as well as central and peripheral hemodynamic parameters. Differential effects of empagliflozin on this by age, sex and degree of hypertension are unknown. We assessed the hypothesis that empagliflozin would reduce blood pressure (BP), pulse pressure (PP), a validated surrogate marker of arterial stiffness being determined by the cardiac output and the stiffness of elastic central arteries like the aorta and wave reflection (PP = systolic BP – diastolic BP), and mean arterial pressure (MAP), a measure reflecting the cardiac cycle and is determined by the cardiac output, systemic vascular resistance, and central venous pressure (MAP = ([2 x diastolic BP]+ systolic BP)/3) across these subgroups. It was also postulated that greater reductions would be seen in those with highest baseline systolic BP and advanced age.

Methods:

Overall 2477 patients were analyzed from four 24-week phase III randomized trials (on no, one or two background glucose lowering drugs) of empagliflozin 10 mg or 25 mg (n=1652) versus placebo (n=825). Patients in these trials had type 2 diabetes, HbA1c ≥7% and ≤10%, a body mass index ≤45 kg/m2 and were on a diet and exercise programme.

Results:

Mean± SD age was 55.6±10.2 years, HbA1c 8.0±0.9 %, systolic BP/diastolic BP 129.1±15.0/78.3±8.8 mmHg, heart rate 74±10 and BMI 28.7±5.5 m/kg2 for the overall population and demographics and baseline characteristics were generally balanced between treatment groups. HbA1c was significantly reduced with EMPA (pooled dosages) compared to placebo (mean [SE]):-0.65% (0.03), p<0.001). SBP, DBP, PP and MAP were reduced in all subgroups. For SBP and MAP, greater reductions were observed in those with highest SBP whereas PP was reduced most in those with advanced age (Table).

Conclusions:

Reductions in BP and arterial stiffness are two of the effects of SGLT2 inhibitors that might ameliorate cardiovascular risk in patients with type 2 diabetes. EMPA-REG OUTCOME™ (NCT01131676), reporting 2015, will evaluate if these benefits will translate into CV risk reduction.

Table. Adjusted mean changes from baseline in systolic and diastolic BP, pulse pressure and mean arterial pressure for empagliflozin relative to placebo after 24 weeks of treatment.

	Adjusted Mean† (SE) Difference Empagliflozin (EMPA 10/25 mg) vs. Placebo (PBO) at Week 24 in 4 pooled 24-week phase III trials (N=2477)			
Subgroup	**Systolic BP (mmHg)**	**Diastolic BP (mmHg)**	**Pulse pressure (mmHg)**	**MAP (mmHg)**
Age (yrs), (N)				
<50 PBO=222/EMPA=464	-3.3 (0.9)***	-1.1 (0.6)	**-2.2 (0.7)****	-1.8 (0.6)**
50 to 64 PBO=459/EMPA=871	-3.4 (0.6)***	-1.8 (0.4)***	**-1.6 (0.5)****	-2.3 (0.4)***
65 to 74 PBO=119/EMPA=276	-4.0 (1.2)**	-0.3 (0.8)	**-3.6 (0.9)*****	-1.6 (0.8)
≥75 PBO=25/EMPA=41	-8.3 (2.8)**	-0.1 (1.7)	**-8.2 (2.2)*****	-2.8 (1.9)
Interaction p-value across subgroups	*p=0.3648*	*p=0.2837*	***p=0.0107***	*p=0.7884*
Sex, (N)				
Male PBO=424/EMPA=927	-3.8 (0.6)***	-1.5 (0.4)***	-2.3 (0.5)***	-2.3 (0.4)***
Female PBO=401/EMPA=725	-3.4 (0.7)***	-1.2 (0.4)**	-2.2 (0.5)***	-1.9 (0.5)***
Interaction p-value across subgroups	*p=0.5982*	*p=0.5461*	*p=0.8506*	*p=0.5255*
Systolic BP (mmHg)				
SBP < 130 (mean SBP:118.4) PBO=462/EMPA=891	**-2.6 (0.6)*****	-0.8 (0.4)*	-1.7 (0.5)***	**-1.4 (0.4)*****
SBP 130-140 (mean SBP: 134.6) PBO=201/EMPA=412	**-4.0 (1.0)*****	-1.7 (0.6)**	-2.4 (0.7)**	**-2.5 (0.6)*****
SBP >140 (mean SBP: 151.0) PBO=162/EMPA=349	**-6.3 (1.1)*****	-2.3 (0.7)***	-3.6 (0.8)***	**-3.6 (0.7)*****
Interaction p-value across subgroups	***p=0.0130***	*p=0.1233*	*p=0.1242*	***p=0.0266***

Adjusted mean (SE) from ANCOVA with LOCF imputation in randomized patients who received ≥1 dose of study medication and had a baseline HbA1c value. Data after initiation of anti-diabetes rescue therapy were set to missing.

*p<0.05, **p<0.01, ***p<0.001 vs PBO.

#4099442

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Abstract topic Chronic Kidney Disease

Abstract title Contrasting Influences of Renal Function on Blood Pressure and HbA1c Reductions with Empagliflozin: Pooled Analysis of Phase III Trials

Abstract text

Introduction:

The sodium glucose cotransporter 2 (SGLT2) inhibitor empagliflozin reduces HbA1c, weight and blood pressure (BP) in patients with type 2 diabetes mellitus (T2DM). While glucose lowering with empagliflozin is dependent on renal function, it is less well under stood how chronic kidney disease (CKD) influences BP moderation with EMPA.

Methods:

In five randomized Phase III trials, 2286 patients with T2DM received empagliflozin 25 mg or placebo for 24 weeks as monotherapy or add-on therapy. Using pooled data from these trials, we assessed changes from baseline in systolic BP (SBP) and HbA1c with empagliflozin 25 mg vs placebo in subgroups by baseline estimated glomerular filtration rate (eGFR; Modification of Diet in Renal Disease equation), adjusting for differences in baseline SBP (SBP analyses only), HbA1c, region, treatment, study, eGFR and treatment by eGFR interaction between groups.

Results:

In patients with normal renal function, or stage 2 or 3 CKD, empagliflozin significantly reduced HbA1c and SBP versus PBO. As expected, placebo-corrected HbA1c reductions with empagliflozin decreased with decreasing eGFR. In contrast, placebo-corrected reductions in SBP with empagliflozin appeared to be maintained with decreasing eGFR (Table).

Conclusions:

Unlike HbA1c, reductions in SBP with empagliflozin in patients with T2DM appeared to be maintained in patients with lower eGFR, indicating that SBP modulation with empagliflozin may involve pathways other than urinary glucose excretion such as diuretic effects, weight loss, reduced arterial stiffness, or direct vascular effects.

	HbA1c		SBP (mmHg)	
	PBO	EMPA 25mg	PBO	EMPA 25mg
eGFR ≥90 mL/min/1.73m² (normal renal function), N	343	348	343	348
Baseline	8.08 (0.05)	8.02 (0.05)	127.2 (0.8)	126.4 (0.8)
Change from baseline (Week 24)	-0.04 (0.04)	-0.88 (0.04)	-1.8 (0.7)	-5.0 (0.6)
Difference vs placebo (95% CI)		-0.84 (-0.95, -0.72)***		-3.2 (-4.9, -1.5)***
eGFR ≥60 to <90 mL/min/1.73m² (CKD stage 2), N	516	518	516	518
Baseline	8.03 (0.04)	7.94 (0.04)	130.5 (0.7)	131.5 (0.7)
Change from baseline (Week 24)	-0.07 (0.03)	-0.67 (0.03)	-0.2 (0.5)	-4.2 (0.5)
Difference vs placebo (95% CI)		-0.60 (-0.70, -0.51)***		-4.0 (-5.4, -2.6)***
eGFR ≥30 to <60 mL/min/1.73m² (CKD stage 3), N	239[a]	234[a]	239[b]	234[a]
Baseline	7.98 (0.05)	7.99 (0.05)	134.7 (1.1)	135.6 (1.2)
Change from baseline (Week 24)	-0.03 (0.06)	-0.40 (0.06)	1.7 (0.8)	-3.8 (0.8)
Difference vs placebo (95% CI)		-0.38 (-0.52, -0.24)***		-5.5 (-7.6, -3.4)***
eGFR <30 mL/min/1.73m² (CKD stage 4), N	46	42	46	42
Baseline	8.14 (0.14)	7.94 (0.15)	144.2 (3.4)	140.9 (3.3)
Change from baseline (Week 24)	-0.12 (0.12)	-0.16 (0.12)	5.5 (1.8)	-1.1 (1.8)
Difference vs placebo (95% CI)		-0.04 (-0.37, 0.29)		-6.6 (-11.4, -1.8)**

Baseline data are mean (SE), changes are adjusted mean (SE) from ANCOVA with LOCF imputation in randomised patients who received ≥1 dose of study medication and had a baseline HbA1c value.
Data after initiation of antidiabeties rescue therapy were set to missing
HbA1c: P <0.001 for interaction between treatment and baseline eGFR; systolic blood pressure: P =0.262 for interaction between treatment and baseline eGFR.
** P<0.01 vs placebo; *** P =0.001 vs placebo
[a]n=102 with eGFR ≥30 to <45 mL/min/1.73m²; [b]n=97 with eGFR ≥30 to <45 mL/min/1.73m²

#4238919

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Abstract topic Other

Please describe other topic Basic science, gene expression, Next generation sequencing.

Abstract title Next Generation RNAseq in Formalin-Fixed Parafin Embeddedrenal biopsies reveals Tumor Necrosis Factor-α Inducible Protein 6 (TNFAIP6) as a single gene classifier in clear cell Renal Cell Carcinoma

Abstract text

Introduction and aims:

Next generation RNA sequencing of mRNA has previously been limited to fresh frozen material. The release of Illumina's RNA Access library preparation kit has led to major improvement in the cDNA library quality from FFPE tissues. In this study we have demonstrated the feasibility of next generation RNA sequencing in FFPE tissues as compared with RNAlater stored tissues. We also present a novel single gene classifier in ccRCC, thus demonstrating the strength of this method.

Methods:

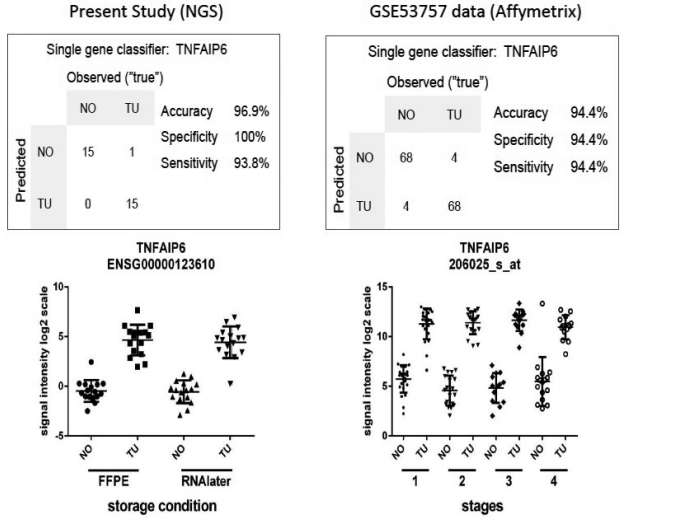
Four core biopsies from 16 patients with histologically-confirmed clear cell renal cell carcinoma (ccRCC) and non-tumorous ("normal") tissue were either FFPE or stored in an RNA-stabilizing agent (RNAlater®, Qiagen) for up to one year until analyses. Total RNA was extracted utilizing the miRNeasy FFPE kit or the miRNeasy micro kit (Qiagen), respectively. Transcriptome sequencing libraries were prepared using the TruSeq RNA Access Library Prep Kit® (Illumina). Sequencing was performed at an Illumina HiSeq 2500 instrument. Alignment of reads to the GRCh38 reference genome was guided by Tophat and Bowtie, respectively. Comparative analysis was done using voom/Limma R-package. Pathway analysis was performed with Ingenuity Pathway Analysis (IPA).

Results:

Analysis of the FFPE and the RNAlater® datasets yielded similar numbers of detected RNA species, average expression levels, differentially expressed transcripts and significantly affected pathways. In principle component analysis (PCA), samples segregated by disease status, rather than by storage condition. We also present a novel single gene classifier in ccRCC: TNFAIP6. This molecule had higher Levels of gene expression in all of the cancer samples from our patient cohort. Validation on a publically available microarray data-set showed upregulation in all tumor stages.

Conclusions:

TNFAIP6 performs well as a single gene classifier in ccRCC. The feasibility of next generation RNAseq in FFPE tissues has been demonstrated. This opens up the possibility of performing these analyses on well characterized cohorts of patients in all kinds of renal diseases where archival FFPE tissues are readily available.



Tumor Necrosis Factor α Inducible Protein 6 (TNFAIP6) as a single gene classifier in clear cell Renal Cell Carcinoma (ccRCC) in present study and in a publically available microarray dataset

#3886192

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Abstract topic Hypertension

Abstract title Directly observed therapy with subsequent ambulatory blood pressure revealed nonadherence in 1/3 of apparent treatment resistant hypertensive patients

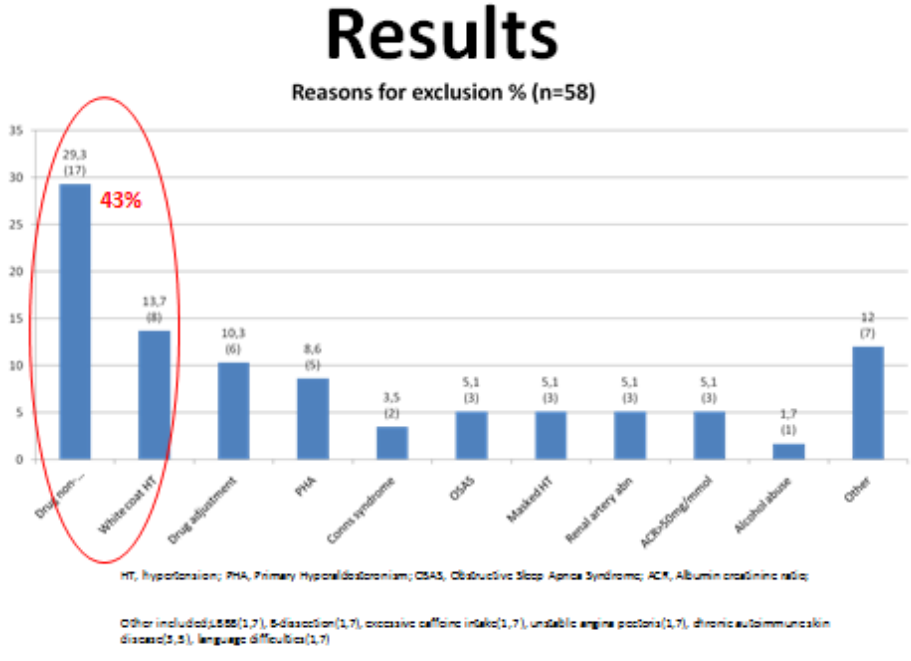
Abstract text

Introduction:
Treatment resistant hypertension is a challenge for the physician and represents a substantial cardiovascular risk for patients. While many patients are referred to specialists for resistant hypertension, the true resistant subjects are hard to find. We aimed to report the reasons for noneligibility in the Oslo Renal Denervation (RDN) Study following directly observed therapy (DOT) of antihypertensive drugs prior to ambulatory blood pressure monitoring (ABPM).

Design and Method:
Patients with apparent resistant hypertension (n=83), supposed to fulfill the inclusion/exclusion criteria which were similar but not identical with the SYMPLICITY HTN-2 criteria, were referred for renal denervation. All patients went through a thorough clinical and laboratory work-up including screening for renovascular hypertension, renal disease, primary hyperaldosteronism, Cushing's syndrome and pheochromocytoma. Non-adherence to antihypertensive drugs and white coat hypertension were controlled for by DOT followed by ABPM.

Results:
The proportion of patients being noneligible for renal denervation according to our inclusion/exclusion criteria was 69.9 % (n = 58). The main reasons for noneligibility were normalization of blood pressure following witnessed intake of antihypertensive drugs (DOT) (43%, n= 25). Those with high office blood pressure in our clinic, but without prior ABPM from their referring physician, who had normal ABPM after DOT, were labeled white coat hypertensives (n= 8). However, the possibility of non-adherence even among these subjects cannot be ruled out.

Conclusions:
True treatment resistant hypertension is rare. Secondary and spurious hypertension can be revealed and treated when medical evaluation of the patients is done thoroughly and according to guidelines by hypertension specialists. Non-adherence seems to be the most common reason for uncontrolled hypertension and may be revealed by directly observed therapy (DOT) followed by ambulatory BP.



#4232044

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Abstract topic Kidney Stones and Bone-Mineral Disorder

Abstract title Epidemiology of childhood kidney stone disease in Icelandic children: a population-based study

Abstract text
Introduction:
The purpose of the study was to investigate trends in the incidence and prevalence of kidney stone disease in Icelandic children over the past 3 decades.
Methods:
Medical information systems of all major hospitals and medical imaging centers in Iceland, were searched for ICD, radiology and surgical procedure codes indicative of kidney stones for subjects <18 years of age for the years 1985 to 2013. Incidence was calculated for the time periods 1985-1989, 1990-1994, 1995-1999, 2000-2004, 2005-2009 and 2010-2013, based on population information for Icelandic children in these years. Prevalence was calculated for the years 1999-2013.
Results:
From 1985 to 2013, there were 186 incident patients, 110 (59%) of whom were female. Median (range) age at diagnosis was 15.0 (0.2-17.99) years. The annual incidence increased from a mean of 3.7/100,000 in the first 5 years to 11.0/100,000 in the years 1995-2004, but decreased thereafter and was 7.8/100,000 during 2010-2013. This trend was especially pronounced in boys, for whom the incidence was 4.7/100,000 in the first time period, 11.0/100,000 in 2000-2004 and only 2.4/100,000 during 2010-2013. For girls, the incidence rose from 2.7/100,000 in the first time period to 14.2/100,000 in 1995-1999 and has since then remained stable and was 13.6/100,000 in 2010-2013. The largest incidence increase was seen in girls aged 14-17 years, for whom it increased from 9.8/100,000 in 1985-1989 to 39.2/100,000 in 2010-2013. The mean annual prevalence of kidney stone disease in 1999-2013 was 44/100,000 for boys and 51/100,000 for girls.
Conclusions:
The incidence increase observed and the current incidence of kidney stone disease in Icelandic children is similar to what has recently been reported in the USA. A significant incidence rise was observed for both genders early in the study period but thereafter it trended downwards in boys but remained stable in girls. These trends cannot be adequately explained and need further study.

#4232390

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Abstract topic Kidney Stones and Bone-Mineral Disorder

Abstract title Recurrence of kidney stones in Icelandic children: a population-based study

Abstract text
Introduction:
The 5-year recurrence rate of kidney stones in adults is in the range of 30-50%. No population-based data are available on the recurrence of childhood kidney stone disease. The purpose of this study was to examine the recurrence rate of stone disease in Icelandic children.
Methods:
Patients were identified by searching medical information systems of all the major hospitals and the only freestanding radiology clinic in Iceland for diagnostic, radiology and surgical codes indicating kidney stones in 1985-2013. We subsequently examined medical records of patients with kidney stones for information on stone recurrence. A recurrent stone event was defined as a radiologic sign of a new stone or a new episode of flank pain and hematuria. Kaplan-Meier analysis was used to assess stone-free survival and groups were compared with the log-rank test.
Results:
We identified 186 children with stone disease during the study period. There were 76 boys with a median (range) age of 14.6 (0.2-17.9) years and 110 girls aged 15.4 (0.8-17.9) years. The follow-up time was 13.0 (0-36) years. A total of 67 children (37%) experienced a second stone event, at a median of 1.9 (0.9-18.9) years after the initial diagnosis. The recurrence rate was 26%, 35%, 41% and 46% after 5, 10, 15 and 20 years, respectively. There was no significant difference in recurrence rate between boys and girls ($p=0.24$) and those under and over 13 years of age at diagnosis ($p=0.56$), but a significant difference between patients diagnosed in 1985-1994, 1995-2004 and 2005-2013 was observed, with a 5-year recurrence rate of 9%, 24% and 38%, respectively ($p=0.002$).
Conclusions:
In our population-based study, the recurrence rate of childhood kidney stone disease is similar to that previously reported in the adult population. Further, the rate of recurrence appears to be increasing as has been reported for the incidence of childhood stone disease. The observed increase in recurrence rate may be related to improved diagnosis and documentation of stone events and/or environmental factors affecting urinary lithogenicity.

#4146739

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Abstract topic Other

Please describe other topic Development of teaching tools for urine microscopy - useful in AKI and CKD . Focus on the importance of good skills in urine microscopy to differnetiate between various causes of renal pathology.

Abstract title Teaching tools for improving skills in urine microscopy: development of an application for cellular phones/tablets and a training program for junior doctors

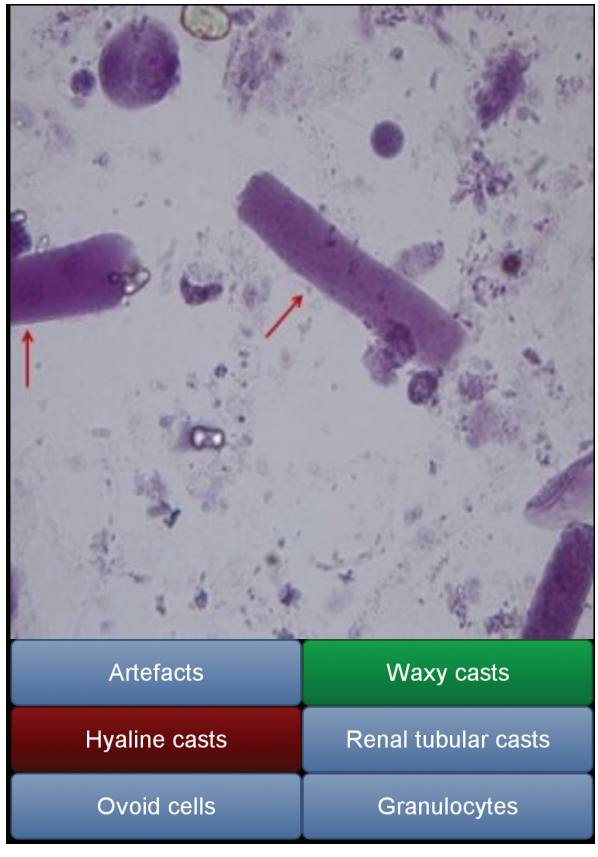
Abstract text

Introduction:
Urine microscopy is essential to differentiate between various causes of renal disease. An audit conducted at Diakonhjemmet Hospital revealed a substantial potential for improvement in urine microscopy among doctors and biomedical laboratory scientists (1). The aim of this project was to develop teaching tools for urine microscopy.

Methods:
Urine microscopy images were sampled from our laboratory routine work and a guide for particle identification was prepared, based on the European Urinalysis Guidelines (2). Text and images were programmed to function on cellular phones/tablets, and the app was distributed free of charge on a non-profit basis. A training program for junior doctors was established, covering basic and advanced skills according to the guidelines (2). Training was organized as weekly sessions led by authorized biomedical laboratory scientists around a teaching microscope, and was included in the doctors' work schedule every 6-12 weeks. Subsequently, doctors were tested without previous notice by a multiple choice test of urine microscopy images, and doctors at a neighbor hospital served as control group. No aids were allowed when taking the test (i.e. no use of the app).

Results:
The urine microscopy app has from March 2012 through May 2015 via Apples App store and Google Play been installed on more than 35,000 mobile devices (> 10,000 on IPhone, > 25,000 on Android). The app has received good ratings, and we have got numerous responses that users find it helpful. Only 7 junior doctors who had participated in the training program were present at the day of the test, and these had 59% correct answers, whereas 16 junior doctors in the control group had 51% correct answers. 60 doctors completed the test, 73 % of whom had ≥ 1 error that we classified as major error. Doctors with training program had less major errors than controls.

Conclusions:
Doctors tested in our project have a potential for improvement to master urine microscopy. With sparse data, we cannot draw firm conclusions on the effect of our training program, but we believe that training as well as availability of a guide of reference such as our app can be helpful.



#4224608

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Abstract topic Renal Replacement Therapy

Abstract title Mortality risk in post-transplantation diabetes mellitus: discordance between the glucose and hba1c based diagnostic criteria

Abstract text

Introduction:

Post-transplantation diabetes mellitus (PTDM) is associated with increased morbidity and mortality. Current diagnostic criteria for PTDM are either fasting plasma glucose (fPG) ≥ 7.0 mmol/L (≥ 126 mg/dL) or a 2-hour post-challenge plasma glucose ≥ 11.1 mmol/L (≥ 200 mg/dL) during an oral glucose tolerance test (OGTT). Recently the diagnostic criteria for type 2 diabetes of glycosylated hemoglobin (HbA1c) ≥ 6.5 % (≥ 48 mmol/mol) was proposed also for PTDM. We examined HbA1c based criteria compared with conventional glucose criteria in the early phase after transplantation as a predictor of mortality.

Materials:

In this retrospective cohort study of 1996 renal transplant recipients, transplanted between 1999 and 2011, we estimated mortality hazard ratios for patients diagnosed with PTDM. The study participants underwent weekly fPG measurements during the first 10 weeks after transplantation, followed by an OGTT and HbA1c measurements at 10 weeks post-transplant.

Results:

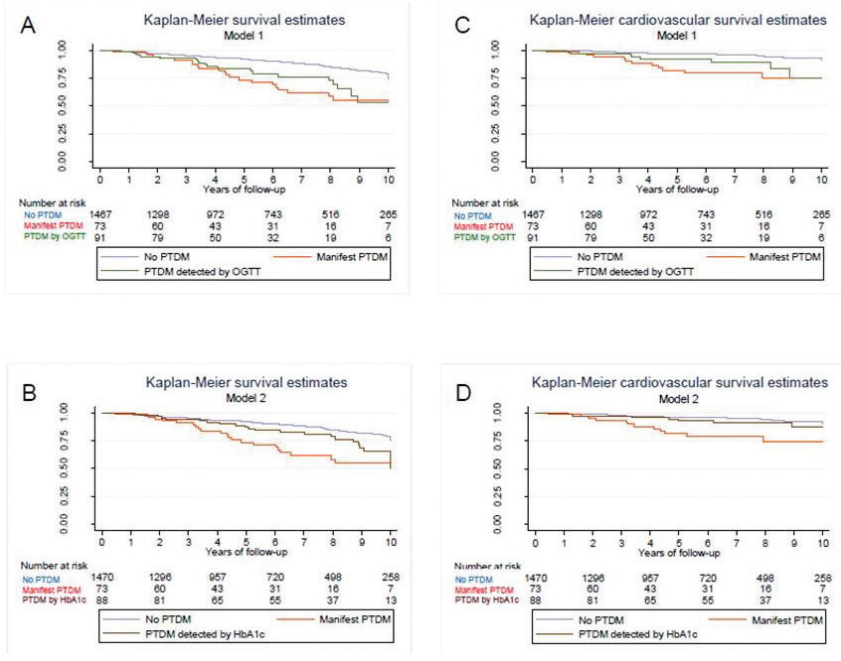
During a median follow-up of 5.4 years, 314 patients died. Both PTDM detected by an OGTT (OGTT criteria) and persistent hyperglycemia throughout the first 2 months post-transplant (manifest PTDM) were associated with mortality (OGTT criteria: adjusted hazard ratio [HR] 1.64, 95 % confidence interval [CI] 1.02 – 2.63, p=0.04. Manifest PTDM: adjusted HR 2.21, 95 % CI 1.40 – 3.49, p=0.001). PTDM detected by HbA1c ≥ 6.5 % (≥ 48 mmol/mol) was not associated with mortality (adjusted HR 0.96, 95% CI 0.61 – 1.51, p=0.86).

Conclusions:

Our findings confirmed that, in the early phase after renal transplantation, PTDM diagnosed by conventional glucose criteria, as opposed to the HbA1c criterion, predicted mortality.

Caption file attachments:

Kaplan-Meier survival curves in renal transplant recipients without diabetes at the time of transplantation (n=1641); Proportion of surviving patients according to diagnostic criteria for PTDM for all-cause and cardiovascular mortality



#4229977

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Abstract topic Chronic Kidney Disease

Abstract title Comparison of Allopurinol and Febuxostat in APRT Deficiency: effect on Urinary 2,8-Dihydroxyadenine Excretion

Abstract text
Introduction:
The xanthine dehydrogenase (XDH) inhibitor allopurinol is known to prevent nephrolithiasis and chronic kidney disease in patients with adenine phosphoribosyltransferase (APRT) deficiency by decreasing the synthesis of 2,8-dihydroxyadenine (DHA). The aim of this exploratory pilot study was to compare the efficacy of allopurinol and the non-purine XDH inhibitor febuxostat in reducing urinary DHA excretion.
Methods:
Patients with eGFR >60 mL/min/1.73 m2 who are listed in the APRT Deficiency Registry of the Rare Kidney Stone Consortium and currently receiving allopurinol therapy, were enrolled in a 42-day pilot study. After 7-day washout period, the subjects were prescribed 400 mg of allopurinol in a single daily dose for 14 days. After a second 7-day washout period, all subjects were prescribed 80 mg febuxostat in a single daily dose for another 14 days. Urinary DHA excretion was evaluated at the end of the first washout period and at the end of allopurinol and febuxostat treatment periods (days 7, 21 and 42). Urinary DHA was measured using UPLC-MS/MS and expressed as DHA-to-creatinine ratio (ng/mmol).
Results:
To date, 8 patients have completed their participation in the study. The median (range) urinary DHA-to-creatinine ratio in early morning urine samples was 2.41 (1.22-6.11) mg/mmol off therapy, 0.66 (0.15-1.02) mg/mmol on allopurinol and 0.17 (below quantification (BLQ)-0.80) mg/mmol on febuxostat treatment. Statistical significance was not calculated due to the small number of subjects.
Conclusions:
A marked decrease in the DHA-to-creatinine ratio was observed with both allopurinol and febuxostat therapy. In the prescribed doses, febuxostat appears to be more efficacious than allopurinol in reducing DHA excretion in patients with APRT deficiency. These results need to be confirmed in a larger patient sample.

#4195188

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Abstract topic Other

Please describe other topic Kidney transplantation, complications

Abstract title Cancer incidence in Icelandic kidney transplant recipients and mortality.

Abstract text

Background:

A few population-based studies have shown an increased incidence of certain types of cancer in transplant recipients, especially non-melanoma skin cancer (NMSC). It is unknown how this increased cancer risk influences patient survival.

Methods:

Using nationwide Icelandic registers, we identified all Icelandic kidney transplant recipients from 1970-2015 and followed them for cancer occurrence and death. Relative risks of cancer in comparison with the general population were expressed as standardized incidence ratios (SIR). Kaplan Meier analysis was used for patient survival and Log rank test for comparison. Multivariable Cox-regression analysis was done to evaluate the independent risk of cancer on death. Recipient and donor age and sex and underlying kidney disease were accounted for in the model.

Results:

We identified 43 malignancies in 234 kidney transplant recipients. SIR for all cancer was 4.1 (95%CI 3.0-5.5), NMSC 63.1 (95% CI 40.5-94.0), non-Hodgkin lymphoma 11.5 (95%CI 2.38-33.72), lip cancer 61.2 (95%CI 12.6-178.9) and 1.87 (95%CI 1.1-2.9) for all cancer without NMSC. Patient survival was significantly worse in patients with cancer in the period from 1995-2015 ($p<0.001$). Patient age and cancer diagnosis were independent risk factors for death.

Conclusion:

The increase in cancer risk in our patients is similar to other larger populations. The results emphasize the importance of prophylactic measures, especially for skin cancer. The consequences of cancer in transplant recipients need to be explored further, but is associated with increased mortality in our study.

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Abstract topic Acute Kidney Injury

Abstract title Oxalate nephropathy due to excessive dietary intake of almonds and intestinal dysbiosis

Abstract text

Introduction:
Oxalate nephropathy is characterized by the deposition of calcium-oxalate complexes in the kidneys. Its underlying cause in adults is mainly secondary hyperoxaluria. Secondary hyperoxaluria is related to a broad spectrum of medical conditions. This disorder is a known complication of malabsorption seen in cystic fibrosis, inflammatory bowel diseases and secondary to bariatric surgery. Several cases of Oxalate nephropathy due to customized diets, excessive intake of ascorbic acid and consumption of ethylene glycol have also been reported. Recent studies indicate that intestinal dysbiosis, with the absence of the oxalate degrading bacteria Oxalobacter Formigenes could contribute to increased intestinal oxalate absorption.

Methods:
We present a case report based on anamnestic and clinical data as well as on histological, radiological and laboratory findings.

Results:
A previously healthy 49-year-old male was admitted with a creatinine level of 1265 umol/L (60-105), following several weeks of tiredness and loss of appetite. Clinical examination was without abnormal findings. There was no proteinuria and urine microscopy was normal. Ultrasound examination showed normal sized kidneys, but there were high echogenicity and signs of small calculi on renal papillae. A renal biopsy revealed excessive depositions of oxalate crystals with tubulointerstitial damage. Further questioning revealed that the patient had a high dietary intake of almonds, due to subjective intolerance of many other foods. His daily oxalate intake was estimated to be around 1100 mg, which corresponds to approximate 10-fold excess compared to a usual Western diet. A fecal PCR examination could not detect O. formigenes. This suggests the lack of this bacterium in his intestinal microbiota.

Conclusion:
We conclude that this patient's renal failure is caused by excessive dietary intake of oxalate rich foods combined with an intestinal dysbiosis. Almonds are rich in oxalate and studies indicate that oxalate from almonds has very high bioavailability. Oxalate nephropathy may be an underrecognized cause of renal failure and a thorough dietary history should always be obtained.

Caption file attachments:
Figure: Kidney biopsy with multiple crystals in the tubular lumina (a,b). Crystals were birefringence under polarized light (c), consistent with oxalate crystals (Hematoxylin-Eosin, range A: 100µm, B: 50 µm and C: 20µm).