**Kliiniline küsimus nr 3**

*Kliiniline küsimus tekst*

Kas kõigile esmaselt diagnoositud kroonilise neeruhaigusega patsientidele tuleb kroonilise neeruhaiguse diagnoosi täpsustamiseks lisaks albuminuuria/proteinuuria, kreatiniini, glomerulaarfiltratsiooni määramisele ja ultraheliuuringule järgmisi lisauuringuid vs mitte:

-kreatiniini kordamine

-PSA

-eesnäärme ultraheli

-jääkuriin

-günekoloogiline kontroll

Kriitilised tulemusnäitajad: haigestumine kroonilisse neeruhaigusesse, patsiendi elukvaliteet, hospitaliseerimine, südame-veresoonkonna tüsistused, elulemus, üldsuremuse vähenemine

**Süstemaatilised ülevaated**

Allpool toodud tabelisse on lisatud nii süstemaatilised ülevaated kui ka üksikud uuringud (cross-sectional studies) ning mõned üldised ravijuhendid, mis pole meie meekonna poolt AGREEga hinnatud. Need said lisatud tõenduspõhise kirjanduse vähesuse tõttu antud teema kohta.

Esmaselt diagnoositud kroonilise neeruhaiguse (KNH) patsientide kreatiniini kordamise kohta uuemad süstemaatilised ülevaated ja uuringud puuduvad (ei leitud). Soovitused GFR ja kreatiniini määramise ja kordamise kohta on olemas neljas uuemas ravijuhendis (KDIGO, NICE, Malaysia CKD management, CHA-KARI).

KNH ja eesnäärme haiguste skriinimise ja diagnoosimise kohta on leitud 3 uuringut.

Esimeses uuringus on välja toodud seos madalama GFR, fPSA ja %fPSA ning eesnäärme vähi riski vahel nendel meestel, kellel tPSA on vahemikus 4,0-10,0 ng/ml.

Kahes järgmises uuringus (2. ja 3.) on vaadatud seost neerufunktsiooni ja PSA taseme vahel. Mõlemas uuringus tuli välja negatiivne seos GFR ja fPSA, %fPSA vahel (madalama filtratsiooniga isikutel fPSA ei ellimineeru organismist, fPSA kuhjub ja tulemusena tõstab %fPSAd. Nendel haigetel jääb eesnäärme vähk diagnoosimata. Seega, antud uuringute põhjal fPSA määramine KNH haigetel ei ole näidustatud).

4., 5. ja 6. süstemaatilises ülevaates on välja toodud enamuses samad uuringud PSA kohta üldpopulatsioonis eesnäärmevähi skriinimisel ja diagnoosimisel. Antud materjali alusel ei ole võmalik välja tuua ühte kindlat skriiningu strateegiat, kuna igas ülevaates on soovitused mõnevõrra erinevad: PSAd on soovitav kasutada eesnäärme vähi skriiningus vs PSA määramine üksinda ei paranda diagnoosi ega vähenda suremust vs tasub määrata ainult riskirühma kontingendil. KNHga seoseid skriinimisel ei ole kirjaldatud.

Ühes uuringus on kirjeldatud jääkuriini ja KHN seoseid eesmäärme healoomulise hüperplaasia patsientidel. Tulemustes leiti, et väike jääkuiriin (< 100ml) on seotud KNHga ja võib olla KNH kujunemise riskiteguriks.

Ühes uuemas uuringus on hinnatud GFRi ja alumiste kuseteede sümptomitega (LUTS skoori järgi) keskealisi mehi. Uuringus on kasutatud eesnäärme ultraheliuuringut, jääkuriini ja uriini voolukiiruse mõõtmist. Tulemustes leiti, et GFRi langusega oli oluliselt seotud ainult langenud uriini voolukiirus. Puudus oluline seos langenud GFR koos suurenenud eesnäärmega ja jääkuriini hulga vahel. Uuringu puuduseks oli asjaolu, et ultraheliuuringut ei kasutatud kõikidel patsientidel eesnäärme suuruse määramiseks.

Uuemaid süstemaatilisi ülevaateid günekoloogilise kontrolli kohta KNH haigetel ning KNHga seoste leidmiseks andmebaasidest ei leitud. On olemas uus ravijuhend günekoloogilise läbivaatuse kohta üldpopulatsioonis. Eraldi KNH patsiendid pole ravijuhendis käsitletud.

**Viited**

|  |  |
| --- | --- |
| **Kokkuvõtte (abstract või kokkuvõtlikum info)** | **Viide kirjandusallikale** |
| 1. Differences in prostate cancer detection rates according to the level of glomerular filtration rate in patients with prostate specific antigen levels of 4.0-10.0 ng/ml (2013) | **Aims:** To investigate differences in prostate cancer detection rates according to the level of glomerular filtration rates (GFR). **Materials and methods:** Patients with prostate-specific antigen (PSA) levels of 4.0–10.0 ng/ml were analysed. Age, serum creatinine, estimated GFR, body mass index, total PSA (tPSA), free PSA (fPSA), per cent free PSA (%fPSA), comorbidities, biopsy Gleason sum and per cent positive core were retrospectively reviewed. All parameters were compared to show whether patients with GFR < 60 ml/min/1.73 m2 (group A) have higher risk of prostate cancer than patients with GFR ≥ 60 (group B). The primary endpoint was cancer detection rate and the secondary endpoints were differences in mean tPSA, fPSA, %fPSA and pathologic outcomes. **Results:** A total of **1092 men** (243 cancer patients) were included. Mean age was 65.8 ± 7.7years. No differences in mean age and tPSA were found between groups A and B. Mean fPSA, %fPSA and cancer detection rate were significantly higher in group A than group B. The incidence of %fPSA < 25% was significantly lower in group A than in group B. **GFR < 60 ml/min/1.73 m2, fPSA and %fPSA < 25% were significant predictors for the presence of prostate cancer in patients with tPSA between 4 and 10 ng/ml. However, %fPSA < 25% was not a significant predictor for group A. Conclusions:** Because of the increased cancer detection rates in patients with CKD of stage ≥ 3 whose tPSA levels are 4.0–10.0 ng/ml, performing prostate biopsy should be actively considered in patients with CKD. **Limitations:** retrospective nature of the analyses of the clinical parameters. Although serum creatinine concentrations (or estimated GFR) are widely accepted as one of the important measurements of kidney function, they are not completely reliable because serum creatinine levels can be influenced by not only renal function but also other many clinical factors. The findings of this study are based on an entirely Asian population and therefore may not be relevant for the general population.    <http://onlinelibrary.wiley.com/doi/10.1111/j.1742-1241.2012.03014.x/abstract;jsessionid=415D5ED2C6A92909EE36433B5A0FA256.f03t04> |
| 2. Increase in percent free prostate-specific antigen in men with chronic kidney disease (2009) | **Aim.** In this study, we evaluated whether moderate-to-severe chronic renal dysfunction, but with no need for dialysis, also importantly affects percent fPSA.  **Methods.** The study group consisted of **101 men** (median age 57 years, interquartile range 46–68) with chronic kidney disease and no diagnosis of prostate cancer. Their median glomerular filtration rate (GFR) was 23 mL/min/1.73 m2 (interquartile range 16–33; range 8–83), determined by iohexol clearance. Controls included 5264 men (median age 57 years, interquartile range 54–62) attending a prostate cancer screening program with no diagnosis of prostate cancer during **8 years of follow-up**.  **Results.** With adjustment for age, median fPSA levels and percent fPSA were significantly higher (*P* < 0.001) in patients with renal dysfunction, 0.45 μg/L and 47.2%, respectively, compared to controls, 0.29 μg/L and 29.9%, respectively. Regression analysis in the study group showed a significant association between GFR and percent fPSA (*P* = 0.036).  **Conclusions.** The percent fPSA is importantly influenced by moderately impaired renal function in men with chronic kidney disease. For such men, use of the current clinical decision limits for percent fPSA could cause some men with prostate cancer to be misdiagnosed as having benign disease, and therefore **fPSA should not be used to diagnose prostate cancer in these patients.**  <http://ndt.oxfordjournals.org/content/24/4/1238.abstract> |
| **3. Association Between Glomerular Filtration Rate, Free, Total, and Percent Free Prostate-specific Antigen (2009)** | Objectives To determine the relationship between glomerular filtration rate (GFR) and free prostate-specific antigen (fPSA), percent-free PSA (%fPSA), and total PSA (tPSA) in patients with diminished kidney function not on dialysis, using nationally representative data. Methods Cross-sectional study. A total of 3782 men aged ≥ 40 years who participated in the National Health and Nutrition Examination Survey 2001-2006, and who met eligibility criteria for PSA testing were included in the final study population. GFR (mL/min/1.73 m2) was calculated using the Modification of Diet in Renal Disease equation 7 and categorized as ≥ 90, 60 to < 90, and 15 to < 60. Distribution of tPSA, fPSA, and %fPSA were estimated by GFR category and by age and race. Multivariate linear regression models were fit to determine the adjusted relationship between GFR and tPSA and %fPSA after adjusting for age, race, and body mass index. Results The multivariate linear regression analysis showed that GFR had a linear relationship with tPSA that was of borderline significance. There was a significant nonlinear relationship between GFR and %fPSA (P <.001): increased GFR was associated with a decrease in %fPSA for GFR levels below 90 [eg, change in %fPSA = −2.67 (95% CI −3.56, −1.77) for a GFR of 85 as compared with 65; P <.001]. The decline in %fPSA with increasing GFR was nonsignificant for GFR levels above 90. Conclusions Our finding that renal function as measured by GFR is negatively associated with %fPSA has potential implications for use of this test in men with renal disease. The same results are shown in other studies (discussed in comments). Described studies have shown that fPSA and %PSA are elevated in men with ESRD or on dialysis. <http://www.goldjournal.net/article/S00904295%2809%2900934-0/abstract> |
| 4. Prostate-specific antigen screening: A critical review of current research and guidelines (2012) | Süstemaatiline ülevaade kirjandusest (2007-2012), mis käsitleb PSA määramise olulisust (kasu vs kahju) eesnäärme haiguste (vähi) skriiningmeetodina. Tehtud ülevaade 5-st suurest uuringust (PLCO uuring: 76,693 pts, Rotterdam uuring: 42,376 pts, Göteborg uuring: 20,000pts, ERSPC: 162,387 pts, ERSPC adjusted: 162, 243 pts) ning 6-st ravijuhendist (2008-2011).  Tulemused: PSA määramine skriiningtestina on näidustatud, vanuseline piir pole täpselt  määratletud (suuremate uuringute soovituse alusel alates 40 eluaastat). Kui PSA tase on   1. ng/ml või madalam, siis järgmine skreening 45-aastaselt ning al. 50st eluaastast iga aasta.   Kui PSA on kõrgem kui 1,0ng/ml siis suunata uroloogile. Eraldi KNH haigetel PSA skriiningu kasu ja vajadust selles ülevaates pole kirjeldatud.  <http://onlinelibrary.wiley.com/doi/10.1002/2327-6924.12094/abstract;jsessionid=F527B60BADD1E50C0151D685A30E1860.f02t01> |
| 5. Is prostate-specific antigen effective for population screening of prostate cancer? A systematic review. (2013) | Aim: We investigated the ef­fectiveness of PSA population screening in a systematic review.  The study was conducted using existing systematic reviews. We searched Ovid MEDLINE,  Embase, Cochrane library, and the major Korean databases. The quality of the systematic  reviews was assessed by two reviewers independently using AMSTAR. Ran­domized controlled trials were assessed using the risk of bias tool in the Cochrane group. Meta-analyses were conducted using Review Manager. The level of evidence of each out­come was assessed using GRADE.  Six studies (ERSPC, French ERSPC, Göteborg, PLCO, Quebec, Norrköping),  The levels of evidence as determined by GRADE were from very low to moderate (Table 5). None of the studies reported the ran­domization sequence or allocation concealment  methods, so all outcomes were initially downgraded.  **Table 5.** Level of evidence assessed by GRADE   |  |  | | --- | --- | | Level of evidence | | | All-cause mortality | Moderate | | Prostate cancer-specific mortality | Moderate | | Prostate cancer diagnosis | Low | | Diagnosis of Pca on stage 1 | Low | | Diagnosis of Pca on stage 2 | Very low | | Diagnosis of Pca on stages 3-4 | Moderate |   Results and conclusion:  No difference in all-cause mortality was ob­served between the screening and control groups (RR, 0.99; 95% CI, 0.98-1.01, P =0.50). Prostate-cancer-specific mortality, all-cause mortality, and diagnosis of prostate cancer at stages 3-4 showed moderate levels of evidence. Differently from prior studies, our review included updated Norrköping data and assessed the sole effect of PSA testing for prostate cancer screening. PSA screening alone did not increase early stage prostate cancer detection and did not lower mortality.  KNH haigetel PSA skriiningu kasu ja vajadust selles ülevaates pole kirjeldatud.  <http://www.annlabmed.org/journal/viewJournal.html?year=2013&vol=33&page=233> |
| 6. Screening for prostate cancer with the prostate-specific antigen test: a review of current evidence.(2014) | Ülevaade käsitleb 2 suure randomiseeritud uuringu tulemusi (ERSPC jälgimisperioodiga 11 aastat ja PLCO jälgimisperioodiga 13 aastat). **Results**  Two trials—the Prostate, Lung, Colorectal and Ovarian (PLCO) screening trial and the European Randomized Study of Screening for Prostate Cancer (ERSPC)—dominate the evidence regarding PSA screening. The former trial demonstrated an increase in cancer incidence in the screening group (relative risk [RR], 1.12; 95% CI, 1.07-1.17) but no cancer-specific mortality benefit to PSA screening after 13-year follow-up (RR, 1.09; 95% CI, 0.87-1.36). The ERSPC demonstrated an increase in cancer incidence with screening (RR, 1.63; 95% CI, 1.57-1.69) and an improvement in the risk of prostate cancer–specific death after 11 years (RR, 0.79; 95% CI, 0.68-0.91). The ERSPC documented that 37 additional men needed to receive a diagnosis through screening for every 1 fewer prostate cancer death after 11 years of follow-up among men aged 55 to 69 years (level B evidence for prostate cancer mortality reduction). Harms associated with screening include false-positive results and complications of biopsy and treatment. Modeling studies suggest that this high ratio of additional men receiving diagnoses to prostate cancer deaths prevented will decrease during a longer follow-up (level B evidence).  **Conclusion** Only men who express a definite preference for screening should have PSA testing. Other strategies to mitigate the potential harms of screening include considering biennial screening, a higher PSA threshold for biopsy, and conservative therapy for men receiving a new diagnosis of prostate cancer.  <http://jama.jamanetwork.com/article.aspx?articleid=1841972> |
| 7. Association between chronic kidney disease and small residual urine volumes in patients with benign prostatic hyperplasia.(2011) | **Aim:** It has been well described that large residual urine volumes (≥300 mL) affect renal function in advanced benign prostatic hyperplasia (BPH). However, it is not clear whether small residual urine volumes (<100 mL) are related to renal function. The present study was performed to examine the association between chronic kidney disease (CKD) and the post-void residual urine volume (PVR) in BPH patients.  **Methods:** A cross-sectional study was performed in 160 consecutive BPH patients with PVR of less than 100 mL. We first determined the stage of CKD and compared the PVR in subjects with/without CKD. Next, we divided the subjects into three groups according to the extent of PVR (PVR < 12 mL, 12 mL ≤ PVR < 50 mL, 50 mL ≤ PVR < 100 mL) and compared the estimated glomerular filtration rate (eGFR) among these groups. Moreover, risk factors associated with CKD, including the presence of post-void residual urine, were explored by multiple logistic regression analysis.  **Results:** The PVR of the patients with CKD was significantly greater than that of the patients without CKD. The group with the normal PVR (group PVR < 12 mL) had a significantly higher eGFR compared with the other two groups. **Multivariate analysis demonstrated that the presence of post-void residual urine (PVR ≥12 mL) was a significant and independent risk factor associated with the presence of CKD.**  **Conclusion:** In BPH patients, the PVR of the patients with CKD was significantly greater than that of the patients without CKD and the presence of post-void residual urine (PVR ≥12 mL) was independently associated with CKD, indicating a close association between CKD and small residual urine volumes.  **Limitations:** cross-sectional design; proteinuria dipstick test, might have underestimated the number of albuminuria pts aming CKD stage 1 and 2; renal ultrasound were not done on all of the patients, so that it ispossible that the number of CKD stage 1 and 2 patients was underestimated  <http://onlinelibrary.wiley.com/doi/10.1111/j.1440-1797.2010.01430.x/abstract> |
| 8. Relationship of estimated glomerular filtration rate with lower urinary tract symptoms/benign prostatic hyperplasia measures in middle-aged men with moderate to severe lower urinary tract symptoms. (2013) | Objective: To evaluate the relationship of the glomerular filtration rate (GFR) and lower urinary tract symptoms (LUTS)/benign prostatic hyperplasia measures in middle-aged men.Methods: A total of 1400 male police officers with moderate and severe LUTS (international prostate symptoms score [IPSS] >7) and aged 40-59 years who had participated in a health examination were included. LUTS/benign prostatic hyperplasia was measured with IPSS, transrectal ultrasonography, uroflowmetry, and postvoid residual urine volume. We estimated the GFR using the Chronic Kidney Disease Epidemiology Collaboration equation. Spearman correlation tests and multiple linear regression tests were used to evaluate the relationship.Results: The median age was 50.0 years, and the median GFR was 85.3 mL/min/1.73 m2. The GFR showed a significant positive correlation with the maximal flow rate (Qmax; r = .112; P <.001). However, there was no significant correlation of GFR with IPSS (r = −.018; P = .493), total prostate volume (r = −.032; P = .237), and postvoid residual (r = −.066; P = .051). After adjusting for age, body mass index (BMI), and metabolic syndrome, only Qmax showed a positive correlation with GFR (beta = .114; P = .003).Conclusion: Qmax demonstrated a significant correlation with GFR in middle-aged men with moderate to severe LUTS in this study. Our data suggest that improved clinical attention is required for patients with LUTS and a low Qmax.Limitations: cross-sectional nature, single institution (potential selection bias) <http://www.goldjournal.net/article/S0090-4295%2813%2901041-8/abstract> |
| 9. ACR Appropriateness Criteria® lower urinary tract symptoms: suspicion of benign prostatic hyperplasia. (2014) | American College of Radiology guideline  Guideline Objective(s)  To evaluate the appropriateness of radiologic examinations in investigating lower urinary tract symptoms and suspected benign prostatic hyperplasia (BPH)  Target Population  Male patients with lower urinary tract symptoms and suspicion of benign prostatic hyperplasia (BPH)  **In patients with azotemia or a high postvoid residual rate, the collecting system of the kidneys should be imaged for evidence of hydronephrosis.**  <http://www.guideline.gov/content.aspx?id=48292&search=prostate+ultrasound+AND+chronic+kidney+disease> |
| **10. Renal Relevant Radiology: Use of Ultrasound in Kidney**  **Disease and Nephrology Procedures (2014)** | Artiklis kirjeldatud ultraheli kasutusvõimalusi nefroloogias.  CKD  Sonography should be performed in all patients with CKD primarily to recognize advanced, irreversible kidney disease that would obviate any additional workup, including biopsy (11). Signs include small size, thin cortex, and cysts, but one must be cautious in making the diagnosis based solely on size in the 9- to 10-cm range when the kidneys are otherwise normal. Although cortical echogenicity is often increased in CKD, normal echogenicity is not unusual, and echogenicity can increase in reversible disease. Thus, echogenicity alone is not a reliable indicator of CKD. Sonography can also identify specific causes, such as urinary obstruction, polycystic kidney disease, reflux nephropathy, and interstitial nephritis.  <http://cjasn.asnjournals.org/content/9/2/373.full.pdf+html> |
| 11. Screening Pelvic Examination in Adult Women: A Clinical Practice Guideline From the American College of Physicians (2014) | Uus ravijuhend günekoloogilise läbivaatuse kohta üldpopulatsioonis. Eraldi KNH patsiendid pole käsitletud.  <http://annals.org/article.aspx?articleid=1884537> |

**Ravijuhendid**

Neljas ravijuhendis (KDIGO, NICE, MALAYSIA CKD MANAGEMENT, CHA-KARI) leidub infot eGFR ja kreatiniini kordusmääramise ning neerude ultraheli kohta. Soovitused on *not graded.*

\***KDIGO** ravijuhendis on soovitatud esmaselt diagnoositud CKD korral uurida eelmisi eGFR väärtusi, korrata eGFR, albuminuuriat/proteinuuriat, uriini analüüsi ning teostada radioloogilisi uuringuid, et hinnata neerude olemasolu, asetust, suurust, parenhüümi paksust. Korrata analüüse ja uuringuid 3 kuu jooksul ning 3 kuu möödudes.

\***Malaysia ja NICE CKD** ravijuhendites leidub infot neerude ultraheli kohta. Soovitused põhinevad koostajate kogemusel, teaduspõhist kirjandust pole leitud.

Soovitused:

Neerude sonograafia on esimene valikmeetod neerude visualiseerimiseks, mille abil on võimalik diagnoosida obstruktiivset uropaatiat, hinnata neerude suurust, asetust, struktuuri (polütsüstilised neerud, parenhüümi atroofia).

Neerude ultraheli näidustusteks on:

-Kiire neerufunktsiooni langus

-Mikro- või makrohematuuria

-Kuseteede obstruktsiooni sümptomid või anamnees

-Neerude polütsüstoosi pereanamnees ja patsiendi vanus >20 aastat

-CKD 4. ja 5. staadium

-Neerubiopsia teostamine ultraheli kontrolli all

\***CHA-KARI** ravijuhendis on antud soovitused (ungraded) GFR/kreatiniini/uurea/albumiini kordamise (1 nädalase intervalliga) ja neerude sonograafia kohta CKD diagnoosimisel.

**Kokkuvõte: KNH diagnoosi täpsustamiseks tuleb uurida eelmisi GFR väärtusi, korrata kreatiniini, eGFR, albuminuuriat/proteinuuriat ja uriini analüüsi 1 nädala pärast ning edaspidi korrata 3 kuu jooksul. Kui 3 kuu möödudes neerufunktsiooni näitajad jäävad kõrgenenuks, siis võib diagnoosida KNH. Samuti diagnoosi täpsustamiseks tuleb teostada neerude ultraheli uuring, et hinnata neerude asetust, suurust ja struktuuri. Infot eesnäärme lisauuringute (PSA, ultraheli, jääkuriin) ja günekoloogilise kontrolli kohta KNH haigete ravijuhendites ei ole.**

**KDIGO CKD evaluation and management (p.65)**

1.4: EVALUATION OF CKD

1.4.1: Evaluation of chronicity

1.4.1.1: In people with GFR **<**60 ml/min/1.73m2 (GFR categories G3a-G5) or markers of kidney damage, review past history and previous measurements to determine duration of kidney disease. (Not Graded)

If duration is **>**3 months, CKD is confirmed. Follow recommendations for CKD.

If duration is not >3 months or unclear, CKD is not confirmed. Patients may have CKD or acute kidney diseases (including AKI) or both and tests should be repeated accordingly.

RATIONALE

When evidence of CKD is first ascertained, proof of chronicity can be obtained or confirmed by:

(i) review of past measurements of GFR;

(ii) review of past measurements of albuminuria or proteinuria and urine examinations;

(iii) imaging findings such as reduced kidney size and reduction in cortical thickness;

(iv) pathological findings such as fibrosis and atrophy;

(v) medical history especially duration of disorders known to cause CKD;

(vi) repeat measurements within and beyond the 3 month point.

***Final grade for overall quality of evidence Grade* (Table 41)**

Quality of Evidence Meaning

A High We are confident that the true effect lies close to that of

the estimate of the effect.

B Moderate The true effect is likely to be close to the estimate of the

effect, but there is a possibility that it is substantially different.

C Low The true effect may be substantially different from the estimate of the effect.

D Very low The estimate of effect is very uncertain, and often will be far from the truth.

**Malaysia Guidelines (Management of chronic kidney disease) (p.9)**

2.5 RENAL TRACT ULTRASOUND

Ultrasound is a useful first line test for imaging the renal tract in patients with CKD. It identifies obstructive uropathy, renal size and symmetry, renal scarring and polycystic disease

Indications for renal ultrasound in patients with CKD:

• a rapid deterioration of renal function (eGFR >5 ml/min/1.73m2 within

one year or 10 ml/min/1.73m2 within five years)

• visible or persistent non-visible haematuria

• symptoms or history of urinary tract obstruction

• a family history of polycystic kidney disease and age over 20 years

• stage 4 or 5 CKD

• when a renal biopsy is required

***Levels of evidence***

|  |  |
| --- | --- |
| **Level** | **Study design** |
| I | Evidence from at least one properly randomised controlled trial |
| II-1 | Evidence obtained from well-designed controlled trials without  randomisation |
| II-2 | Evidence obtained from well-designed cohort or case-control  analytic studies, preferably from more than one centre or  group |
| II-3 | Evidence from multiple time series with or without intervention.  Dramatic results in uncontrolled experiments (such as the  results of the introduction of penicillin treatment in the 1940s)  could also be regarded as this type of evidence |
| III | Opinions of respected authorities based on clinical experience;  descriptive studies and case reports; or reports of expert  committees |

**GRADES OF RECOMMENDATION**

|  |  |
| --- | --- |
| A | At least one meta analysis, systematic review, or RCT, or  evidence rated as good and directly applicable to the target  population |
| B | Evidence from well conducted clinical trials, directly applicable  to the target population, and demonstrating overall consistency  of results; or evidence extrapolated from meta analysis,  systematic review, or RCT |
| C | Evidence from expert committee reports, or opinions and /or  clinical experiences of respected authorities; indicates absence  of directly applicable clinical studies of good quality |

**NICE Guidelines (p.159-160)**

**Indications for renal ultrasound in the evaluation of CKD**

**6.4.1 Clinical introduction**

Ultrasound is the first-line imaging study for evaluating people with previously undiagnosed kidney disease. It helps the clinician separate end stage kidney disease from potentially reversible acute kidney injury or earlier stages of CKD by:

· \_determining the presence, size and shape of kidneys and assessing cortical thickness prior to renal biopsy

· \_identifying obstructive uropathy

· \_assessing renal scarring

· \_identifying polycystic kidney disease

Although ultrasound is the optimal imaging modality for CKD, it is not known what proportion of those with CKD will benefit from ultrasound imaging.

**What are the indications for renal ultrasound in adults with CKD?**

**6.4.2 Methodology**

Due to the difficulty in searching this question, the results of a broad literature search were reviewed for systematic reviews on criteria for referral for renal ultrasound in a CKD population. No studies were identified. An algorithm was provided by a GDG member, who had conducted an (unpublished) retrospective analysis of people with CKD undergoing ultrasound scans. The algorithm served as a starting point to guide discussions and enabled the GDG to formulate consensus recommendations.

**From evidence to recommendation**

There was no evidence on which to base recommendations about when a renal ultrasound scan should be performed in people with CKD.

The recommendations about the use of renal ultrasound scanning are based on knowledge of the information that an ultrasound scan provides.

Renal ultrasound can be used to confirm that people have two kidneys, to measure the size of the kidneys and to

show structural abnormalities in the kidney such as polycystic kidneys. Ultrasound scans can also be used to identify the presence of renal tract obstruction.

Ultrasound may identify renal size discrepancy but where diagnosis or exclusion of renovascular disease is indicated additional imaging such as CT angiography or magnetic resonance renal angiography will be required (newer generation MR scanners may afford imaging of vessels without exposure to gadolinium and the attendant risks of nephrogenic systemic fibrosis).

A renal ultrasound scan is always necessary before undertaking a renal biopsy.

Ultrasound scanning cannot exclude the diagnosis of autosomal dominant polycystic kidney disease in people under the age of 20 and is therefore of limited use in people under this age with a family history of this condition.

The GDG agreed that before undertaking a renal ultrasound scan in people at risk of kidney disease on the basis of a family history of inherited kidney disease, it was important that people were fully informed of the implications of an abnormal scan result. This should encompass counselling about the benefits of early identification of kidney disease but should also outline the social consequences of a diagnosis, including its effect on life insurance. Where indicated help to cope with the psychological consequences of a diagnosis should be offered.

**6.4.6 Recommendations**

· \_**Offer a renal ultrasound scan to all people with CKD who:**

o **have accelerated progression of CKD**

o **have visible or persistent invisible haematuria**

o **have symptoms of urinary tract obstruction**

o **have a family history of polycystic kidney disease and are aged over 20 years**

o **have a GFR of less than 30 ml/min/1.73 m2 (GFR category G4 or G5)**

o **are considered by a nephrologist to require a renal biopsy. [2008, amended 2014]**

· \_**Advise people with a family history of inherited kidney disease about the implications of an abnormal result before a renal ultrasound scan is arranged for them. [2008]**

***Overall Quality of Outcome Evidence in Grading of Recommendations Assessment, Development and Evaluation (GRADE)***

*Level Description*

**High** Further research is very unlikely to change confidence in the estimate of effect.

**Moderate** Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.

**Low** Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.

**Very Low** Any estimate of effect is very uncertain.

**KHA-CARI giudelines (p.343)**

**Ungraded suggestions for clinical care**

*Diagnosis*

The following diagnostic evaluation tests for CKD are always indicated:

Full blood count

Repeat (within 1 week) serum urea/electrolytes/creatinine/eGFR/albumin

Urine ACR (preferably on a first morning void, although a random urina a acceptable)

Fasting glucose and lipids

Urine microscopy and culture

Renal ultrasound scan

***Evidence grading (Appendix 6, p.47)***

