The 2002 CKD definition and classification system: concept, impact, criticisms and opportunities to move forward

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Disease related to the kidneys

Terminology

- Chronic renal insufficiency
  - Impaired renal function
  - Kidney failure
  - Bright’s disease
  - Renal insufficiency
  - Pre-dialysis state
  - Kidney disease
  - Compensated renal insufficiency
  - End stage renal disease
  - Renal failure
  - End stage kidney disease
  - Pre-uremic state
  - Renal impairment

Focus of nephrology

- Specific aetiologies of kidney disease
- Renal replacement therapy
Definition and staging of CKD (KDOQI 2002)

Goals:
- **Terminology**: common and precise language
- **Concept**: kidney disease can be diagnosed if cause is unknown
- **Differentiation**: staging according to severity

Def.: Kidney damage for ≥3 months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR or GFR <60 mL/min/1.73m² for ≥3 months, with or without kidney damage

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<th>Description</th>
<th>GFR (ml/min/1.73 m²)</th>
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</tr>
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<td>3</td>
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Definition and staging of CKD (KDIGO 2004, 2006)

Process: • Questionnaire to ~10,000 nephrologists worldwide
• 2 Controversies conferences (2004, 2006)
• Intense debate about advantages and disadvantages

Conclusion: endorsement of global use with 2 modifications

Def.: Kidney damage for $\geq$3 months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR or GFR <60 mL/min/1.73m$^2$ for $\geq$3 months, with or without kidney damage

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Conceptual model(s) of CKD

- Preventing Development of CKD (Primary Prevention)
- Preventing Progression and Complications of CKD (Secondary Prevention)
- Treating Kidney Failure (Tertiary Prevention)
US trends in the prevalence of CKD
(Coresh, JAMA 2007)

Age Group: 20-39, 40-59, 60-69, 70+

CKD Stage
- Stage 1
- Stage 2
- Stage 3
- Stage 4

Prevalence, %
0% 5% 10% 15% 20% 25% 30% 35% 40% 45% 50%
Definition and staging of CKD
Implications within 7 years?

HUGE!

**Research**: projects and funding
- CKD is common
- CKD is harmful (risk multiplier)

**Awareness**: individuals and populations
- non-nephrology medical professionals
- patients
- health care administrators

**Policy**: primary and secondary prevention
- detection and follow-up
- scaffold for clinical practice recommendations
Definition and staging of CKD

CONCERNS! (mainly by nephrologists)

Over- and misdiagnosis of CKD
• Prevalence rates considered as implausibly high
• Overuse of speciality resources

Discomfort with terminology
• Disease vs pre-disease vs risk factor
• Use of CKD without knowing the etiology

Methodology
• Imprecision and bias of formulas to estimate GFR
• Lack of validation in specific populations (age, race, comorbidities)
• Methodology and cut-off values for abnormal albumin / protein excretion

Appropriateness of criteria / threshold levels for stages
• CKD stages 1 and 2 – a disease?
• Microalbuminuria – a CV rather than a renal risk factor?
• eGFR < 60 – sufficient to diagnose CKD?
• Age-adaptation needed?
Definition and staging of CKD
Position of KDOQI and KDIGO

The debate is helpful and necessary
• Definitions and classifications are conventions.
• There is a need to adapt them to new knowledge.
• Overdiagnosis is a real concern.

However …..

The risk to lose the common ground is significant

Therefore …..

A structured process is needed for review / revision

• The goal should be: applying a definition and staging system vs not applying it should lead to better patient outcomes!

• There should be consistency with the principles of definition and staging applied in other medical disciplines.

• The benefits of revising a definition and classification need to be balanced against the disadvantages.
Criteria for classification (staging) of different diseases

- Cause
- Structure
- Dissemination
- Function
- Symptoms
- Prognosis
- Treatment
- …..

**Aetiology**
- Examples
  - GN
  - TNM system
  - MM
  - NYHA
  - CKD

**Severity**
## Classification of a disease by severity

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Classification systems in medicine

CKD – Does the current CKD staging system follow these principles?

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- CKD – Does the current CKD staging system follow these principles?
- Less relevant
- Prognosis matters!

To some extent specific
To some extent specific
To some extent specific
Definition and staging of CKD
Questions to be addressed

Do the current CKD definition and stages predict different levels of risk for modifiable outcomes:
  • Cardiovascular disease?
  • CKD progression?
  • Acute kidney injury?

Do they predict risk in different age groups?

Will modifications improve risk prediction?
  • Different GFR thresholds?
  • Proteinuria thresholds?
### Classification systems in medicine

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<td>1st step</td>
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A simple idea ....

The best data base ever available including more than 1 million individuals with eGFR and albuminuria data.

A unique example for common data analysis.

The largest collaborative research effort in Nephrology.