Day Two - Overview

Kai-Uwe Eckardt
CKD as a Global Public Health Problem

Classification

Surveillance

Public policy

Day One

CKD

Day Two

Consequences and causes
BACKGROUND: CKD – more than the risk for dialysis……..

• Prevalence of CKD stage 1-4 more than 50 fold higher than CKD stage 5

• Majority of CKD patients die before reaching “stage 5 D“

• Much of the health risk and socioeconomic burden of CKD probably related to complex interactions with other chronic diseases
CKD as a Global Public Health Problem

CKD – a cardiovascular risk factor

Kaiser Permanente Registry: “Health Care System“ (n=1,120,295)

Mortality rate (per 100 personyears)

<table>
<thead>
<tr>
<th>eGFR (ml/min/1.73 m²)</th>
<th>60</th>
<th>45-59</th>
<th>30-44</th>
<th>15-29</th>
<th>&lt;15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality rate</td>
<td>0.76</td>
<td>1.08</td>
<td>4.76</td>
<td>11.36</td>
<td>14.14</td>
</tr>
</tbody>
</table>

Go et al., *NEJM* 2004

CKD – a noncardiovascular risk factor

Cardiovascular Health Study
Older individuals in community (n=4637)

Hazard with 95% confidence interval

<table>
<thead>
<tr>
<th>Creatinine (mg/dl)</th>
<th>0</th>
<th>0.5</th>
<th>1.0</th>
<th>1.5</th>
<th>2.0</th>
<th>2.5</th>
<th>3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard</td>
<td>6</td>
<td>5</td>
<td>4.3</td>
<td>2</td>
<td>1</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Fried et al., *JASN* 2005
CKD as a Global Public Health Problem

CKD

Chronic diseases

- Cardiovascular Disease
- Infectious Disease
- Cancer
CKD as a Global Public Health Problem

**Plenary Presentations**

- **WHO Chronic Disease Perspective** (R. Jacob)
- **Cardiovascular disease** risk factors for CKD (A. Levin)
- Associations of CKD with **Infectious Disease** (B. Jaber)
- Associations of CKD with **Cancer** (E. Cohen)

**Breakout Sessions**

- Cardiovascular Disease
- Infectious Disease
- Cancer

**Plenary Discussion**
CKD as a Global Public Health Problem

CKD

What is known?

What can be done with what is known?

→ Clinical practice recommendations

What needs to be known?

→ Research recommendations

Chronic diseases

- Cardiovascular Disease
- Infectious Disease
- Cancer
CKD as a Global Public Health Problem

Chronic diseases

- Cardiovascular Disease
- Infectious Disease
- Cancer

What is known?

Pub Med hits:

11030 58 2335

CKD
Little evidence ≠ evidence for absence

Only in the last ten years has the association between CVD and CKD been extensively described!

Annual citation rates for CVD and infection in patients with CKD

Foley et al., *Advances in Chron Kid Dis* 2006
CKD as a Global Public Health Problem

CKD

Chronic diseases

Cardiovascular Disease
Infectious Disease
Cancer
CKD as a Global Public Health Problem

CKD

CKD as a risk factor for CVD

- Hypertension
- Bone and mineral disorder
- Dyslipidemia
- Sympathetic overactivity
- Salt- and volume overload
- Anemia
- Uremic toxins
- “Undertreatment”
- Immunosuppressants

Extensive evidence in this field will serve as a model

Cardiovascular disease
CKD as a Global Public Health Problem

CKD as a risk factor for CVD

- Hypertension
- Bone and mineral disorder
- Dyslipidemia
- Sympathetic overactivity
- Salt- and volume overload
- Anemia
- Uremic toxins
- “Undertreatment”
- Immunosuppressants

CVD (and CVD risk factors) as risk factors for CKD

- Hypertension
- Nephrosclerosis
- Reduced renal perfusion pressure
- Adverse drug effects
- Radiocontrast dye
- Cholesterol emboli

Less studied and a major focus of today

Extensive evidence in this field will serve as a model

Cardiovascular disease
CKD as a Global Public Health Problem

CKD as a risk factor for CVD

- Hypertension
- Bone and mineral disorder
- Dyslipidemia
- Sympathetic overactivity
- Salt- and volume overload
- Anemia
- Uremic toxins
- "Undertreatment"
- Immunosuppressants

**Extensive evidence in this field will serve as a model**

Cardiovascular disease
CKD as a Global Public Health Problem

Plenary Presentations

• WHO Chronic Disease Perspective (R. Jacob)
• Cardiovascular disease risk factors for CKD (A. Levin)
• Associations of CKD with Infectious Disease (B. Jaber)
• Associations of CKD with Cancer (E. Cohen)

Breakout Sessions

Cardiovascular Disease

Infectious Disease

Cancer

Plenary Discussion
CKD as a Global Public Health Problem

CKD as a risk factor for ID

Infectious disease
<table>
<thead>
<tr>
<th>Infectious Diseases (ID)</th>
<th>CKD prevalence</th>
<th>CKD as a risk factor for ID morbidity</th>
<th>CKD as a risk factor for ID mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>HCV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fokus will be on chronic viral and non-viral infections
CKD as a Global Public Health Problem

CKD as a risk factor for ID
- Impaired immune response
- Reduced vaccination efficacy
- Immunosuppressants (primary disease and TX)
- Suboptimal use of anti-infectious drugs
- Dialysis access (HD and PD)

Also important
- Toxicity of antiinfectious agents
- Glomerulopathies (HIVAN !)
- “Underdiagnosis” of CKD (muscle wasting)

Major focus of today

Infectious disease
CKD as a Global Public Health Problem

Plenary Presentations

- WHO Chronic Disease Perspective (R. Jacob)
- Cardiovascular disease risk factors for CKD (A. Levin)
- Associations of CKD with Infectious Disease (B. Jaber)
- Associations of CKD with Cancer (E. Cohen)

Breakout Sessions

Cardiovascular Disease

Infectious Disease

Cancer

Plenary Discussion
CKD as a Global Public Health Problem

CKD

CKD as a risk factor for cancer

Cancer
<table>
<thead>
<tr>
<th>Cancer</th>
<th>CKD prevalence</th>
<th>CKD as a risk factor for cancer morbidity</th>
<th>CKD as a risk factor cancer mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidney and urinary tract tumors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other solid tumors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hematologic malignancies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CKD as a Global Public Health Problem

Major focus of today

CKD as a risk factor for cancer

- Uremic toxins
- Immunosuppressants (primary disease and TX)
- Diuretics
- Proteinuria
- Exclusion of patients from trials
- Reduced treatment
- Reduced testing

Also important

Cancer as a risk factor for CKD

- Paraproteinemias
- Glomerulopathies
- Surgery for kidney cancer
- Urinary tract obstruction
- Toxicity of anti-cancer agents
- Toxicity of bone marrow / stem cell TX
- “Underdiagnosis” of CKD

Cancer
CKD as a Global Public Health Problem

CKD

Risk of getting lost in risk assessment and translation

→ Consider direction of risk

→ Distinguish between:
  - susceptibility risk factors
  - initiation risk factors
  - progression risk factors

→ Try to distinguish between risk factors as markers vs causes

Chronic diseases

Cardiovascular Disease

Infectious Disease

Cancer
CKD as a Global Public Health Problem

CKD

What is known?

What can be done with what is known?
- Clinical practice recommendations

What needs to be known?
- Research recommendations

Chronic diseases

Cardiovascular Disease

Infectious Disease

Cancer
Should patients with chronic ID or cancer be screened for CKD?

Do patients with CKD and ID or cancer need different treatment?

Some important questions:

- Should patients with CKD be screened for ID or cancer?

Diagram:

- Normal → Increased risk
  - Screening for CKD risk factors
  - CKD risk reduction, Screening for CKD
- Damage
  - Diagnosis & treatment, Treat comorbid conditions, Slow progression
- ↓ GFR
  - Estimate progression, Treat complications, Prepare for replacement
- Kidney failure
  - Replacement by dialysis & transplant
- Complications
- CKD death

Some important questions:

- Should patients with chronic ID or cancer be screened for CKD?
CKD as a Global Public Health Problem

Classification    Surveillance    Public policy

Day One

Day Two

Consequences and causes
CKD as a Global Public Health Problem

Plenary Presentations

• WHO Chronic Disease Perspective (R. Jacob)
• Cardiovascular disease risk factors for CKD (A. Levin)
• Associations of CKD with Infectious Disease (B. Jaber)
• Associations of CKD with Cancer (E. Cohen)

Breakout Sessions

Cardiovascular Disease
Infectious Disease
Cancer

Plenary Discussion