Editorial: Public health for chronic kidney disease prevention and care

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More than 850 million people worldwide suffer from kidney disease (1), but not everyone is fortunate to receive professional medical care and treatments. According to the Global Burden Disease study, chronic kidney disease (CKD) and its associated cardiovascular disease caused 2.6 million deaths and 35.8 million disability-adjusted life losses in 2017, especially in medium or low socio-demographic countries (2). Public health research is vital to explore etiology, disease prevention, early detection, intervention effect evaluation, and reasonable resource allocations. However, it is evident that the mainstream CKD studies in the last decade mainly focused on the assessment of drug treatment effects and the correlation between biomarkers and prognosis, with a lack of studies focusing on the etiology or factors associated with CKD progression in one community. Identifying specific etiology and mechanisms affecting CKD development and progression is the leverage point for arranging subsequent actions (3–5) to prevent and manage CKD.

In this Research Topic, we invite global experts to submit their latest research in an attempt to clarify the public health questions currently facing CKD and to explore possible solutions. Although it is unrealistic to expect such a short-term Research Topic to bring many significant impacts, we hope that it will initiate collaboration and more research focus.

This research involves four accepted articles and summarizes their main contributions and relevant implications below.

Environmental determinants

Environmental factors can affect CKD development and progression. Individual risk for CKD development and prognosis may be determined by insurance systems,
neighboring areas, and occupational environments (6). Wu et al.
observed that patients with stage 3b to 5 CKD are exposed long-
term to air pollutants [particles measuring <2.5 μm in diameter,
PM2.5 level ≥ 31.44 μg/m³ or nitrogen dioxide (NO2) ≥ 15.00
ppb] would be associated with higher risks of first-hitting renal
function deterioration. It is worth noting that both ranges are
more elevated than WHO Air Quality Guidelines (15 μg/m³
and 13.3 ppb, respectively) (7). This highlights that governments
need to pay more attention to health equity, especially regarding
environmental threats to kidney health.

Progression risk in the community

Although there are varying scales of CKD screening in
different countries, timely identification of the risk of CKD
progression in a community is challenging. Chu et al.’s study
defined overweight as a body mass index ≥ 24 kg/m² and
metabolically unhealthy as a Homeostasis Model Assessment
of Insulin resistance score ≥ 2.5 in one community cohort.
They discovered that metabolically unhealthy people, regardless
of body weight, compared to those with metabolically healthy
normal weight, increased the incident intensity to a 15% decline
in the estimated glomerular filtration rate (eGFR) in the elderly,
indicating that other metabolic disorders in addition to body
weight should be considered to intervene to prevent renal
function decline. Tsi et al. used 10-year screening survey data
to establish CKD state transition risk functions by common
screening items to improve existing CKD screening practices.
It is anticipated that these study findings could inspire more
longitudinal community-based studies to offer more evidence
based on the natural course of CKD.

Mortality

The mortality risk, especially caused by cardiovascular
disease, is higher than the dialysis risk in the early CKD phase.
Vascular calcification may be an early sign of CKD prognosis.
Wang et al. surveyed cardiovascular events, including non-fatal
myocardial infarction, unstable angina, cerebrovascular events
(intraparenchymal hemorrhage, subarachnoid hemorrhage,
cerebral infarction), hospitalization for congestive heart
failure, serious cardiac arrhythmia (resuscitated cardiac arrest,
ventricular fibrillation, sustained ventricular tachycardia,
paroxysmal ventricular tachycardia, an initial episode of atrial
fibrillation or flutter, severe bradycardia or heart block) and
peripheral arterial disease in patients with CKD stages 1–4.
Their study found that cardiac valvular calcifications were only
associated with cardiovascular events in patients with an eGFR
≥ 45 ml/min/1.73 m². However, abdominal aortic calcifications
were associated with an increased risk of all-cause mortality;
thus, more research is needed to explore the roles of valvular
calcification sites and their clinical significance in CKD.

In conclusion, CKD is a global public health matter. This
research article does not attempt to incur all relevant research in
such a short period, but it is the start of a continuous process to
bring more evidence, attention, and actions on CKD prevention
and care.

Author contributions

All authors listed have made a substantial, direct, and
intellectual contribution to the work and approved it for
publication.

Conflict of interest

The authors declare that the research was conducted in the
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