The effect of the World Kidney Day campaign on the awareness of chronic kidney disease and the status of risk factors for cardiovascular disease and renal progression

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Abstract

Background. Chronic kidney disease (CKD) is a worldwide problem. We describe the trends in CKD awareness before and after the World Kidney Day (WKD) campaign and the impact of the WKD campaign in increasing awareness and appropriate management of the risk factors for cardiovascular disease and renal progression.

Methods. We selected 57 718 people who had undergone a routine health check-up.

Results. The average CKD awareness was 3.1% (95% CI: 2.6%–3.7%) and was increased with progressing CKD stage. The awareness was increased from 1.1% before the WKD campaign to 5.8% after the campaign (P < 0.001). CKD awareness in the post-WKD period was increased in CKD stages 2 (OR 4.535: 95% CI: 2.044–10.062) and 3 (OR 6.614: 95% CI: 4.282–10.217) and profoundly increased in stage 4 (OR 13.800: 95% CI: 2.127–89.524), compared to the pre-WKD period. In the CKD-aware group compared to the CKD-unaware group, the awareness of diabetes mellitus (90.0% versus 54.2%, P < 0.001) and hypertension (87.2% versus 64.7%, P < 0.001) was higher and the levels of systolic blood pressure (116.9 ± 1.0 versus 120.1 ± 0.2, P < 0.01) and serum cholesterol (198.3 ± 2.7 versus 205.0 ± 0.5, P < 0.05) were lower by covariance analysis.

Conclusions. The WKD campaign had a positive impact on the awareness and control of risk factors in CKD subjects but the absolute frequency of CKD awareness still remains undesirable in Korea. We need new campaign strategies to publicize the importance of early diagnosis and appropriate management of CKD.

Keywords: awareness; chronic kidney disease; World Kidney Day

Introduction

Chronic kidney disease (CKD) is a worldwide problem with a dramatically increasing prevalence. According to data from the National Health and Nutrition Examination Surveys (NHANES), the CKD prevalence in the United States increased from 11.0% during the period 1994–1998 to 13.1% between 1999 and 2004 [1]. The CKD prevalence is not lower in Asia than in Western countries. The prevalence of a glomerular filtration rate (GFR) < 60 mL/min/1.73 m² in the adult Japanese population was 19.1% [2] and the CKD prevalence in Beijing was 13.0% [3]. In urban Koreans, the CKD prevalence was 13.7% in late 2007 [4]. CKD is a well-known predictor of hospitalization [5], cardiovascular events [5–8], cardiovascular mortality [5], non-cardiac mortality [9] and all-cause mortality [5–7]. Decreased renal function is also a risk factor for cognitive dysfunction [10] and poor quality of life [11].

Despite these raised risks, CKD is often underdiagnosed [12,13] and patients are not effectively informed about their conditions by medical professionals [14]. The NHANES data showed that CKD awareness was improved in stage 3 only, from 4.7% in 1999–2000 to 9.2% in 2003–2004 [15]. Controlled clinical trials showed that the CKD treatment in its early stages slows down the rate of progression of kidney damage and has a beneficial effect on complications [16,17]. To advance the diagnosis, treatment and prevention of kidney diseases in the developing and developed world, raising the public awareness of the importance of the early recognition and treatment of kidney diseases are among the important missions to which the International Society of Nephrology and the Korean Society of Nephrology (KSN) are dedicated. With this purpose, World Kidney Day (WKD) was instigated on 9 March 2006 and has been celebrated every year since. KSN has participated in this campaign since November 2006 and has continued throughout 2007 and March 2008. Here, we analyse the impact of...
the WKD campaign on the awareness of CKD over time and on the status of risk factors for cardiovascular disease and renal progression in Korea.

Methods

The WKD campaign in Korea

In Korea, the WKD campaign was commenced in November 2006. From November 2006 to March 2007, KSN held news conferences, inviting 30 journalists and television reporters of the three major national-wide broadcasting companies, to disseminate the importance of CKD, the simple screening methods of CKD diagnosis and the prevalence of ESRD in Korea. As a result, 5 national and commercial broadcasts, 2 radio newscasts, 10 newspapers, 18 medical newspapers and 10 internet sites alerted the Korean public to the importance of CKD. During Renal Week in March 2007, the members of KSN held lectures about CKD and events to offer free blood pressure, urinalysis and serum creatinine testing to anyone in clinics and hospitals nationwide. This publication and broadcasting campaign about CKD directed at the general population continued throughout 2007. During Kidney Week in March 2008, KSN presented data on the CKD prevalence in urban Korean cities surveyed as a cross-sectional epidemiologic study [4]. Nationwide, 77 hospitals held public lectures and free medical examinations, including urinalysis, eGFR, BP and glucose, to assist people in getting an early diagnosis of CKD in hospitals and public squares. More than 400 health professionals were involved in the screenings, with the goal of checking ~15 000 individuals. Via this mass media campaign, KSN estimated that ~90% of Koreans gained some information on CKD by March 2008.

Subjects

We searched for data on all 60 729 adult subjects, aged 20 years or more, who had a voluntary, routine health check-up in two affiliated hospitals of Seoul National University Hospital, Seoul National University Bundang Hospital and Healthcare System Gangnam Center in 2005–2006 and 2008. The response rate to the questionnaires for all participants was similar to those rates among subjects grouped according to the examination period; in 2005, 99.7% among 15 715 subjects; in 2006, 99.7% among 16 418 subjects; and in 2008, 99.6% among 28 956 subjects (P > 0.05). In the study analysis, we included 57 718 subjects whose serum creatinine and urinalysis results were available. We grouped the subjects according to the examination year before or after 2007, as this was the year during which the WKD campaign had been held throughout the year in Korea. We analysed the first available data if a subject had repeated examinations during the period.

Questionnaires

The subjects answered questions about smoking and drinking status, about past medical history, such as renal problem/disease, diabetes mellitus (DM), hypertension (HTN), angina pectoris and acute myocardial infarction (AMI), and about medications taken by themselves without guide from assistants before examination. We defined CKD awareness by a ‘yes’ response to the question (in Korean), ‘Have you ever been told by a doctor or health care professional that you have kidney disease or kidney problem?’. The awareness of HTN and DM was determined by a positive response to ever having been told of the diagnosis by a health care provider or a self-reported treatment for the condition.

Measurements and definitions

The subjects came to the hospitals after overnight fasting for at least 12 h, completed the questionnaires and completed blood and urine tests. The serum creatinine was measured by Jaffe reaction with the same automatic analyser (TBA-200FR, Toshiba, Tokyo, Japan) in both hospitals. eGFR was calculated using the Modification of Diet in Renal Disease (MDRD) study equation [18]. Proteinuria was defined by urine dipstick test as being protein 1+ or more. CKD stages were defined as follows: stage 1 (GFR >90 mL/min/1.73 m², and proteinuria 1+ or more), stage 2 (GFR 60–89 mL/min/1.73 m² and proteinuria 1+ or more), stage 3 (GFR 30–59 mL/min/1.73 m²), stage 4 (GFR 15–29 mL/min/1.73 m²) and stage 5 (GFR <15 mL/min/1.73 m²). HTN was defined as SBP of 140 mmHg or greater, DBP of 90 mmHg or greater, a self-reported history of HTN, or use of antihypertensive medications irrespective of BP. DM was defined as a fasting glucose of 126 mg/dl or greater, a self-reported history of DM or use of hypoglycaemic agents. A history of CAD was defined as a self-reported history of angina or AMI. BMI was calculated based on weight and height (weight (kg)/height (m²)). A higher BP was defined as SBP 130 mmHg or more or DBP 80 mmHg or more, hypercholesterolaemia as serum cholesterol 200 mg/dl or more, and hypertriglyceridaemia as serum triglyceride as 150 mg/dl or more.

Statistical analyses

All analyses and calculations were performed using SPSS software (SPSS version 12.0, Chicago, IL, USA). Data were presented as the means ± SDs for continuous variables, the means ± SEs for estimated values of continuous variables with covariance analysis, and as proportions for categorical variables. Differences were analysed using the chi-square test for categorical variables and the Student t-test or one-way ANOVA for continuous variables according to the number of groups. The odds ratio (OR) between a factor of the examination year and CKD awareness was calculated using logistic regression adjusted by clinical parameters which were factors related to CKD awareness in this population and gender. We also analysed the status of cardiovascular risk factors in CKD subjects, such as blood pressure, serum glucose, HbA1c, serum cholesterol and serum triglyceride, according to CKD awareness with multiple logistic regression for categorical variables and covariance analysis for continuous variables adjusted for age, gender, BMI, DM, HTN, history of CAD, proteinuria by the urinary dipstick test and GFR. The level of statistical significance was set at P < 0.05.

Result

CKD prevalence and clinical features

The overall CKD prevalence was 11.27% (95% CI: 11.01–11.53%); stage 1, 0.55% (95% CI: 0.49–0.61%); stage 2, 3.89% (95% CI: 3.73–4.05%); stage 3, 6.79% (95% CI: 6.55–6.69%); stage 4, 0.06% (95% CI: 0.04–0.08%); and stage 5, 0.02% (95% CI: 0.01–0.02%). The proportion of females was 45.3% and the mean age was 48.3 ± 11.7 years. The GFR was 75.0 ± 12.0 ml/min/1.73 m², and the prevalence of HTN, DM and proteinuria by urine dipstick test 1+ or more was 21.3% (95% CI: 21.0–21.6%), 7.1% (95% CI: 6.9–7.3%) and 5.0% (95% CI: 4.9–5.3%), respectively.

Among the parameters, DM prevalence and the mean values of systolic blood pressure (SBP), body mass index (BMI) and serum uric acid were not different among the subjects grouped by examined period (Table 1).

CKD awareness

CKD awareness among the CKD subjects was 3.1% (95% CI: 2.6–3.7%) (199/6507) in all subjects and was increased with increasing CKD stage (P < 0.001); the awareness was 1.6% (95% CI: 0.2–2.9%), 1.5% (95% CI: 1.0–2.0%), 3.8% (95% CI: 3.2–4.4%), 22.2% (95% CI: 8.0–36.5%) and 44.4% (95% CI: 3.4–85.0%) in CKD stages 1–5, respectively. The awareness was only 0.7% (95% CI: 0.3–1.0%) in 2005, but increased gradually to 1.4% (95% CI: 0.3–1.0%) in 2006 and to 5.8% (95% CI: 4.9–6.7%) in 2008 after the WKD campaign. In more detailed grouping by the quarter of a year, the awareness was 0.8% during the first quarter of 2005, 1.1% during the first quarter of 2006, 2.7% during the first quarter of 2007, and 7.6% during the fourth quarter of 2008 (Figure 1). CKD awareness was significantly increased in subjects examined during the second
Table 1. Clinical characteristics of subjects

<table>
<thead>
<tr>
<th>Examined period</th>
<th>pre-WKD</th>
<th>post-WKD</th>
<th>P-value</th>
<th>Completeness of data (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>15 088</td>
<td>15 680</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>49.5 ± 12.2</td>
<td>48.0 ± 12.2</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Sex (female %)</td>
<td>46.7 ± 12.2</td>
<td>45.3 ± 12.2</td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>DM (%)</td>
<td>7.4 ± 12.2</td>
<td>7.0 ± 12.2</td>
<td>&lt;0.05</td>
<td></td>
</tr>
<tr>
<td>HTN (%)</td>
<td>19.5 ± 12.2</td>
<td>21.6 ± 12.2</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>CAD (%)</td>
<td>1.0 ± 12.2</td>
<td>1.2 ± 12.2</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>116.8 ± 15.9</td>
<td>116.6 ± 15.9</td>
<td>&gt;0.05</td>
<td></td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>74.9 ± 12.3</td>
<td>74.4 ± 12.2</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>23.6 ± 3.1</td>
<td>23.5 ± 3.1</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Haemoglobin (g/dL)</td>
<td>14.5 ± 1.6</td>
<td>14.4 ± 1.6</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Glucose (mg/dL)</td>
<td>100 ± 21</td>
<td>96 ± 20</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Cholesterol (mg/dL)</td>
<td>199 ± 1.4</td>
<td>196 ± 1.4</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Protein (g/dL)</td>
<td>12.0 ± 1.4</td>
<td>12.4 ± 1.4</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Probenecid (%)</td>
<td>6.5 ± 1.4</td>
<td>5.2 ± 1.4</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>CKD (%)</td>
<td>1.4 ± 1.4</td>
<td>4.3 ± 1.4</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>CKD stage 1</td>
<td>1.4 ± 1.4</td>
<td>4.3 ± 1.4</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>CKD stage 2</td>
<td>6.12 ± 1.4</td>
<td>7.98 ± 1.4</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>CKD stage 3</td>
<td>0.10 ± 0.06</td>
<td>0.06 ± 0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CKD stage 4</td>
<td>0.02 ± 0.01</td>
<td>0.01 ± 0.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

pre-WKD: subjects who were examined before WKD campaign, from 2005 to 2006, post-WKD: subjects who were examined after WKD campaign in 2008.

*Difference from the post-WKD group by the chi-square test, P < 0.05.

#Proteinuria: 1+ or more by the urinary dipstick test.

Alphabets on left upper side of numbers: post hoc analysis of Duncan in the one-way ANOVA test.

Fig. 1. The awareness of CKD according to the examined period. *P < 0.05 compared to the period of 1Q 2005, by multiple logistic regression showed on Table 3. 1Q: January–March, 2Q: April–June, 3Q: July–August, 4Q: September–December.

Fig. 2. The changes of CKD awareness according to the examined period and according to clinical parameters. • BMI: body mass index, DM: diabetes mellitus, HTN: hypertension, CAD: coronary artery disease, self-reported.

The absolute difference of awareness between the pre- and post-WKD groups was higher in subjects with one of the following risk factors for cardiovascular disease compared to subjects without any risk factor: male, the elderly aged 50 years or more, BMI 25 kg/m² or more, DM, HTN or a history of CAD (Figure 2). With logistic regression model adjusted by related factors to CKD awareness, CKD subjects examined during the post-WKD period showed 4.74-fold (95% CI: 3.29–6.84, P < 0.001)
greater awareness compared to subjects examined during the pre-WKD period. The odds ratio for awareness was increased 6.30-fold in subjects examined during the second quarter of 2008, 6.19-fold during the third quarter of 2008 and 7.19-fold during the fourth quarter of 2008 compared to subjects examined during the first quarter of 2005 (Table 2). The other factors related to the awareness were GFR level (OR 0.951: 95% CI: 0.938–0.965, \( P < 0.001 \)) and presence of HTN (OR 2.457: 95% CI: 1.791–3.371, \( P < 0.001 \)).

### Effect of CKD awareness on the management of cardiovascular risk factors in the CKD group

In the CKD-aware group, the awareness of DM (90.0% versus 54.2%, \( P < 0.001 \)) and HTN (87.2% versus 64.7%, \( P < 0.001 \)) was higher than in the CKD-unaware group. The levels of SBP and serum cholesterol in the CKD-aware group were lower than in the CKD-unaware group by covariance analysis (Table 3). When we stratified the CKD group according to DM or HTN, CKD awareness was also related to the levels of SBP and serum cholesterol in subjects with DM or HTN (Table 4). Among the hypertensive subjects, the frequency of adequate blood pressure in the CKD-aware group with the criteria of SBP <130 mmHg and DBP <80 mmHg was higher (38.5% versus 23.9%, \( P = 0.001 \)) than in the CKD-unaware group, and the frequency of serum cholesterol <200 mg/dL was higher in the CKD-aware group (58.1% versus 43.1%, \( P = 0.002 \)). The odds ratios for higher BP (SBP ≥130 mmHg and/or DBP ≥80 mmHg) and hypercholesterolaemia (serum cholesterol ≥200 mg/dL) were 0.605 (95% CI: 0.400–0.916) and 0.617 (95% CI: 0.415–0.920) in the CKD-aware group with HTN compared to the CKD-unaware group with HTN, respectively (Figure 3). Among diabetic subjects, the frequency of adequate blood pressure in the CKD-aware group was higher (57.5% versus 40.4%, \( P = 0.032 \)) and the odds ratio for higher BP was 0.452 (95% CI: 0.217–0.942) compared to the CKD-unaware group (Figure 3).

### Discussion

We found that CKD awareness was increased after the WKD campaign in Korea, especially in stage 2, 3 and 4 CKD subjects. CKD awareness was related to higher awareness of HTN and DM in CKD and it improved the risk factors for cardiovascular disease, such as blood pressure and serum cholesterol.

Although the subjects in this survey were volunteers taking a routine health check-up in a metropolitan city of Korea, the CKD prevalence was similar to a previous report with urban Koreans [4], in which subjects comprised adults aged 35 years or more living in seven major cities of Korea. In the report, the CKD prevalence by age decile was 8.8% in subjects aged 35–44 years, 11.1% in subjects aged 45–54 years, 15.0% in subjects aged 55–64 years and 31.0%
World Kidney Day campaign and CKD

Table 4. The status of clinical parameters according to the awareness of CKD in subjects with CKD, stratified with hypertension or diabetes mellitus

<table>
<thead>
<tr>
<th></th>
<th>In subjects without hypertension</th>
<th>In subjects without diabetes mellitus</th>
<th>In subjects with hypertension</th>
<th>In subjects with diabetes mellitus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unaware (n = 4227)</td>
<td>Aware (n = 81)</td>
<td>P-value</td>
<td>Unaware (n = 5443)</td>
</tr>
<tr>
<td>SBP</td>
<td>113.3 ± 0.2</td>
<td>114.6 ± 1.3</td>
<td>&gt;0.05</td>
<td>119.1 ± 0.2</td>
</tr>
<tr>
<td>DBP</td>
<td>71.7 ± 0.1</td>
<td>74.1 ± 1.0</td>
<td>&lt;0.05</td>
<td>75.5 ± 0.1</td>
</tr>
<tr>
<td>Glucose</td>
<td>98.6 ± 0.3</td>
<td>96.7 ± 2.0</td>
<td>&gt;0.05</td>
<td>94.2 ± 0.1</td>
</tr>
<tr>
<td>HbA1c</td>
<td>5.85 ± 0.01</td>
<td>5.86 ± 0.01</td>
<td>&gt;0.05</td>
<td>5.70 ± 0.01</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>203.6 ± 0.5</td>
<td>207.2 ± 4.0</td>
<td>&gt;0.05</td>
<td>204.6 ± 0.5</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>121.2 ± 1.2</td>
<td>118.0 ± 8.8</td>
<td>&gt;0.05</td>
<td>123.5 ± 1.0</td>
</tr>
<tr>
<td></td>
<td>Unaware (n = 2075)</td>
<td>Aware (n = 117)</td>
<td>P-value</td>
<td>Unaware (n = 864)</td>
</tr>
<tr>
<td>SBP</td>
<td>133.6 ± 0.4</td>
<td>127.3 ± 1.6</td>
<td>&lt;0.001</td>
<td>126.8 ± 0.5</td>
</tr>
<tr>
<td>DBP</td>
<td>84.3 ± 0.3</td>
<td>81.3 ± 1.1</td>
<td>&lt;0.05</td>
<td>79.0 ± 0.4</td>
</tr>
<tr>
<td>Glucose</td>
<td>108.5 ± 0.5</td>
<td>108.1 ± 2.2</td>
<td>&gt;0.05</td>
<td>150.2 ± 1.5</td>
</tr>
<tr>
<td>HbA1c</td>
<td>6.18 ± 0.02</td>
<td>6.11 ± 0.07</td>
<td>&gt;0.05</td>
<td>7.57 ± 0.05</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>207.7 ± 0.9</td>
<td>194.0 ± 3.8</td>
<td>&lt;0.001</td>
<td>207.2 ± 1.4</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>150.5 ± 2.0</td>
<td>143.4 ± 8.7</td>
<td>&gt;0.05</td>
<td>178.4 ± 4.0</td>
</tr>
</tbody>
</table>

*Aware: CKD subjects recognized their renal problem. Unaware: CKD subjects with no idea of their renal problem.
SBP: systolic blood pressure (mmHg), DBP: diastolic blood pressure (mmHg), glucose: unit of mg/dL, HbA1c: unit of %, cholesterol: unit of mg/dL, triglyceride: unit of mg/dL, numbers: in mean ±SE, P-value calculated by co-variance analysis (ANCOVA) adjusted with age, gender, BMI, diabetes mellitus, hypertension, history of coronary artery disease, proteinuria by urinary dipstick test, GFR and the period of examination.

in subjects aged 64 years or more, which was similar to the prevalence of this report in the same age groups: 7.6%, 9.5%, 14.6% and 30.7%, respectively.

The GFR level was an important factor to CKD awareness but age and gender were not related, as in other reports [19,20]. The WKD campaign was also an important factor in the heightened awareness. The most powerful factor raising awareness during the WKD campaign may have been the frequent announcements of the CKD prevalence in urban Koreans in March 2008. After this announcement, the frequency of awareness was significantly increased compared to the previous period. During the campaign period, the national survey for renal disease was conducted as usual, using the urine dipstick test as a primary test and the serum creatinine test as a confirmative test to detect renal problems for Koreans with National Medical Insurance Service, biaennially. No other surveys or interventions affecting CKD awareness were conducted by the government or any other organizations. The other factor raising the awareness related to the WKD campaign may have been the frequent broadcasts about the importance, early diagnosis and early treatment of CKD throughout 2007 via all kinds of mass media, including nationwide television broadcasts, local television broadcasts, radios, newspapers and internet. The mass media coverage on behavioural change in relation to screening, medicine taking and treatment preferences suggests that media coverage might prompt individual differences, particularly those at a risk of CKD, to seek health care for early diagnosis and management [21].

With NHANES data, Plantinga confirmed that CKD awareness was increased only in stage 3 CKD subjects from 4.7% in 1999–2000 to 9.2% in 2003–2004, before the launch of the WKD campaign [15]. Through the Kidney Early Evaluation Program (KEEP) in the USA, CKD awareness stages 1–3 increased slightly (4.1% to 5.5%) and CKD awareness stages 4–5 increased more profoundly (19.7–39.4%) from August 2000 to December 2005 [22]. After the WKD campaign, no studies, to the best of our knowledge, have investigated the changes of awareness and the status of management for risk factors. We confirmed that CKD awareness was increased in stage 2, 3 and 4 CKD subjects after the WKD campaign. The awareness was increased more in subjects with the following risk factors to renal progression and cardiovascular disease: male, older age, higher BMI, DM, HTN or CAD. That was considered to be because the higher risk group gave more intention to the campaign, one of the main topics of which was the risk factors involved in the progression of kidney disease and cardiovascular disease in CKD patients, which might be attracted more to patients with the risk factor of CKD than by people without it.

The awareness had an important relationship with control of blood pressure and serum cholesterol level. The blood pressures and serum cholesterol levels in CKD patients were maintained more appropriately in the CKD-aware group than in the CKD-unaware group. The awareness of HTN was strongly associated with HTN treatment and was more by people with it.

Although the WKD campaign had a positive impact on the awareness and control of risk factors in CKD subjects, the absolute frequencies of the awareness and control of
risk factors for renal progression and cardiovascular events remained undesirable. The awareness was still low at <10% for CKD stage 3 or less and at 50% for CKD stage 4 or more, compared to the awareness of DM, 55.8%, and the awareness of HTN, 51.0%, in 2008. The frequency of appropriate blood pressure was only 24.7% in CKD with HTN, and 27.9% of CKD subjects without HTN had SBP 130 mmHg or more and/or DBP 80 mmHg or more. The frequency of DM control with HbA1c <7% was only 43.3% in CKD. Considering this situation, we must setup new strategies to publicize the importance of early diagnosis and appropriate management of CKD to the general population, health care providers and also to the government of Korea. First of all, the WKD cost 551 000 US dollars to announce the importance of CKD to 90% of the 43.7 million Korean population. It only costs ~1.2 cents for one Korean. In 2004, Korea spent 3.24% (0.37 billion US dollars) of medical expenditure on renal disease coded as N18.x and N19.x of ICD-10, that is, ~8 US dollars for each Korean. So, Korea could afford to devote more resources to the campaign to reap more benefits from improving quality of care for CKD patients. Secondly, the campaign should have been carried out throughout the year with planned issues. The awareness was increased just after presenting the data of the prevalence of CKD in March 2008 which the people were interested in knowing. We must find and deliver the information that the population wants to know on a preferential basis. Thirdly, we should encourage the health care providers to understand the importance of CKD, to give the information of medical status to their own patients, to evaluate the CKD appropriately, to be educated on guidelines for CKD and to transfer the CKD patient to nephrologists in appropriate time. The other important action would be to persuade the government to set up a national plan to improve the awareness and the quality of care for CKD.

Several of the study limitations deserve mention. First, the questionnaire item assessing awareness may have been misinterpreted by the participants. As in other studies [15], 2% of respondents without kidney disease answered ‘yes’ to this question, indicating a small amount of misclassification of participant awareness. Secondly, proteinuria defined by the dipstick test with fasting morning urine may have led to misclassification of stage 1 and 2 CKD subjects. Misclassification of disease may also have occurred due to GFR estimation. The simplified MDRD equation is not easily applied in all races, especially in Asians [25]. The MDRD equation has been modified for Japanese and Chinese populations [26,27]. With support from KSN, research is presently being conducted to determine if the MDRD equation is applicable in the Korean population and if a modification coefficient is needed in the Korean equation. The study with preliminary data reported a coefficient variable of 1.110 for Koreans in the abbreviated MDRD equation using creatinine measured by the Jaffe reaction [28]. The data from the present study were collected from 57718 people, but this sample was not taken from the general population, although the CKD prevalence was similar to that in an epidemiologic study [4] surveyed in Korea.

References

Conflict of interest statement. None declared.
Acute kidney injury and myeloma

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Abstract

Background. Myeloma is the second most common haematological malignancy and is a cause of severe acute kidney injury (serum creatinine ≥ 500 μmol/L) that has long been associated with a poor prognosis, although previous series have been small.

Methods. We have therefore documented the natural history of all 107 patients referred to a large regional renal unit over a 20-year period and investigated factors associated with survival over a long period of time using Cox regression methods.

Results. Three factors were found to be significantly and independently associated with survival: use of chemotherapy [hazard ratio (HR) 0.21, 95% CI: 0.08–0.46, P < 0.001], serum albumin (HR 0.49, 95% CI: 0.29–0.82, P = 0.02 for ≥ 35 g/L versus < 35 g/L) and dialysis independence (HR 0.43, 95% CI: 0.24–0.76, P = 0.005). However, survival was not found to be better for patients presenting in the second decade compared to the first (HR 0.88, 95% CI: 0.52–1.50, P = 0.65).

Conclusions. This analysis highlights the need for clinical trials of novel chemotherapy regimens in this complicated group of patients. Furthermore, whether strategies to restore or preserve dialysis-independent renal function provide additional benefit to effective chemotherapy also requires further investigation. The advent of efficacious low toxicity chemotherapy (such as thalidomide and bortezomib) and new dialysis techniques to remove free light chains may radically alter the outcome of this group of patients.

Keywords: acute kidney injury; clinical epidemiology; multiple myeloma; prognosis; survival analysis

Introduction

Multiple myeloma (MM) is a clonal proliferation of plasma cells in which there is a presence of a paraprotein in the serum or urine in almost all patients. MM is defined by the presence of at least two of the following three criteria: (1) a monoclonal protein in serum and/or urine; (2) lytic bone lesions on X-ray and (3) an excess of plasma cells (>10%) in bone marrow. The incidence of MM in the UK is ∼ 50 per million population [1], and MM accounts for 1% of all malignancies and ∼ 15% of all haematological malignancies [2]. Although there are therapies that can improve survival in MM [3,4], it remains an incurable disease, and estimates of median survival vary from 24 months [1] to 44 months [5]. Survival is dependent on the stage of the disease and varies from a median of 62 months in stage 1 disease to 29 months in stage 3 disease [5]. The staging systems used for MM are summarized in Table 1. Renal failure is an ominous complication of MM, and MM is a relatively common doi: 10.1093/ndt/gfp488

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Presentation and survival of patients with severe acute kidney injury and multiple myeloma: a 20-year experience from a single centre

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