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Estimated Burden of Kidney Diseases in Albania during 1990-2019

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Abstract *Aim*: The information about kidney diseases in the general population of Albania is scant and not well-documented. The aim of our analysis was to describe the trend of selected kidney diseases in Albania for the period 1990-2019. *Methods*: Our analysis was based on the estimates available from the Global Burden of Disease (GBD) studies, reported by the Institute for Health Metrics and Evaluation (IHME). For Albania, IHME uses the data mainly available from the National Institute of Statistics. *Results*: The age-standardized proportional mortality due to kidney dysfunction in Albania in 1990 was about 4.2% compared with 6.0% in 2019. There was evidence of a reduction in the past three decades in the mortality rate and burden of acute glomerulonephritis in the Albanian population. At a crude level, chronic kidney disease and its share attributable to hypertension exhibited a gradual increase from 1990 to 2019, whereas the age-standardized estimates were lower in 2019 than in 1990. *Conclusion*: Our analysis summarizes valuable information about the mortality rate and burden of kidney diseases in Albania, a post-communist country in Southeastern Europe characterized by a rapid and intensive process of political and socioeconomic transition. Similar to most of the countries worldwide, kidney diseases constitute a significant health challenge for the health care system in Albania.

Keywords Albania, Burden of Kidney Diseases, Institute for Health Metrics and Evaluation, Kidney Diseases, Kidney Diseases' Mortality

1. Introduction

Albania experienced the breakdown of its socialist regime in 1990 and, ever since, has been undergoing deep political reforms and rapid socioeconomic changes toward a market-oriented economy, which was nevertheless characterized by several setbacks and turmoil [1].

Currently, the population of Albania is characterized by a particularly rapid aging, with about 15% of the population being aged 65 years and above as of 2020 [2]. This process of rapid aging is caused by an increase in life expectancy [2], a decrease in fertility rate [2,3], and the emigration of young adults, which continues unabated [2,3].

Albania is currently in the accession process toward the European Union (EU) integration since June 2014 when it was granted EU candidate status [4]. The economy is growing, but there are still many challenges imposed both internally and globally, in a post COVID-19 era and an ongoing war in Ukraine and other parts of the world.

The information about kidney diseases in the general population of Albania is scant and not well-documented. At a global scale, the burden of chronic kidney disease is increasing in line with the increase in noncommunicable diseases (NCDs) in general [5]. According to the Global Burden of Disease (GBD) 2015 study, chronic kidney disease affects approximately 10% of the world's adult population [6]. This disease is mainly caused by diabetes, hypertension, vascular disease, and glomerulonephritis [5,6]. However, in low-income countries, besides the aforementioned factors, other important causes for many cases of chronic kidney disease include glomerulonephritis

and interstitial nephritis, due to the high prevalence of infections [5-7]. In addition to chronic kidney disease, there are other important kidney disorders including acute glomerulonephritis, acute kidney injuries, polycystic kidney disease, nephrotic syndrome, kidney stones (nephrolithiasis), urinary tract infections, diabetic nephropathy, as well as other kidney diseases and conditions that can affect kidney function and health. For Albania, there is no scientific information about the prevalence and incidence of chronic kidney disease, or other kidney disorders.

2. Objective

In this context, the aim of this analysis was to describe the trend of selected kidney diseases in Albania for the period 1990-2019.

3. Materials and Methods

The current analysis was based on the estimates for Albania provided by the Global Burden of Disease (GBD) 1990 and 2019 studies, which are reported by the Institute for Health Metrics and Evaluation (IHME) [8]. For all countries, IHME estimates mortality using a combination of methods, including statistical modeling, disease-specific models, and cause-of-death modeling [8,9]. The statistical modeling employed by IHME is based on available data from vital registration systems, surveys, and other available sources. These models account for differences in data quality and completeness, as well as variations in mortality rates across different age groups and geographic regions of the world. Furthermore, IHME uses disease-specific models to estimate mortality for specific diseases or conditions [8,9]. Also, cause-of-death modeling is used to estimate mortality by cause of death, which is essential for understanding the leading causes of death in different populations including transitional Albania. These models incorporate data from medical certifications, verbal autopsy, and other sources to estimate cause-specific mortality rates [8,9]. In addition, IHME employs ensemble modeling, a method that combines multiple models to produce more accurate estimates of mortality. This method considers the strengths and weaknesses of different modeling methods and incorporates uncertainty into the estimates [8,9].

For Albania, IHME uses data mainly from the National Institute of Statistics [2,8]. In this analysis, we present data for the years 1990 and 2019 regarding both crude and age-standardized estimates of the following indices: i) selected kidney disease indicators (Table 1) including mortality rate, proportional mortality, and burden of disease (expressed in DALYs); ii) attributable mortality and burden of disease (expressed in DALYs) to kidney dysfunction (Table 2), and; iii) proportional mortality attributable to selected risk factors in Albania (Figure 1).

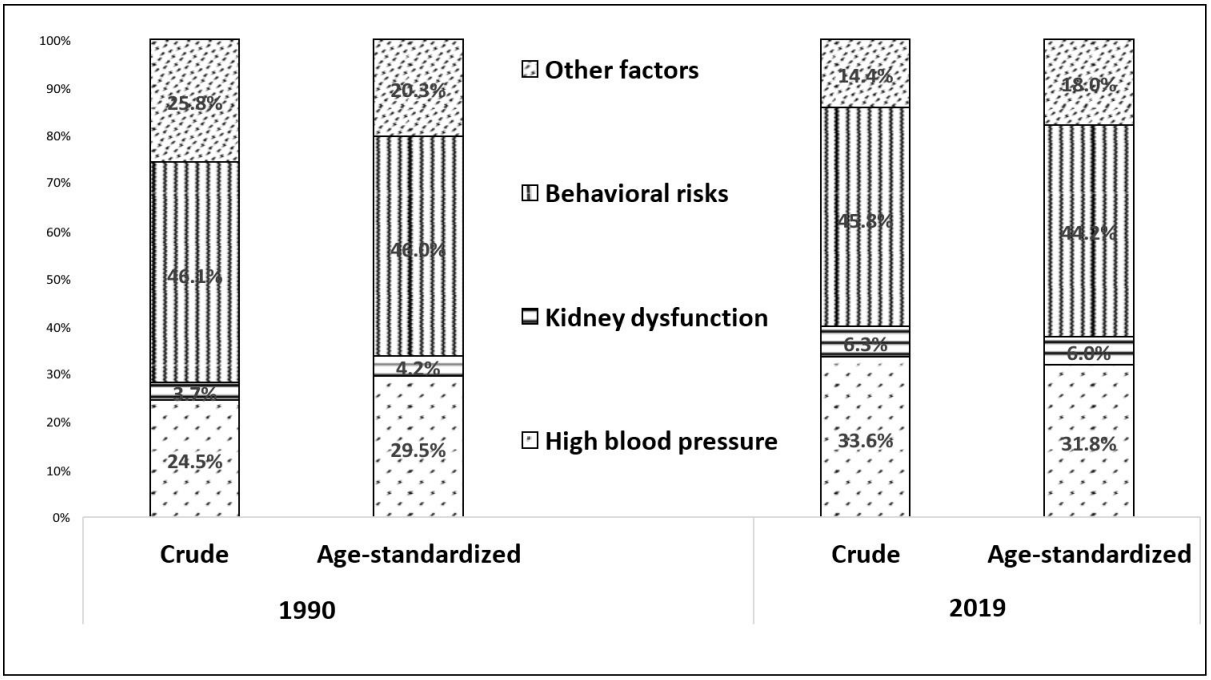

Figure 1. Proportional mortality attributable to selected risk factors in Albania in 1990 and 2019 (crude and age-standardized estimates from IHME)

4. Results

Table 1 presents selected kidney disease indicators for the population of Albania in 1990 (characterized by the breakdown of the socialist regime) and in 2019 (the most recent estimates provided by IHME).

In 1990, the crude mortality rate from acute glomerulonephritis in Albania was estimated at almost 0.5 deaths per 100,000 population, whereas in 2019 it was estimated at only 0.05 deaths per 100,000 population. The difference in the age-standardized rates was even more pronounced: about 0.6 vs. 0.04 deaths per 100,000 population, respectively. The crude mortality rate from chronic kidney disease was about7 in 1990 compared to 12 in 2019 (deaths per 100,000 population). However, an inverse difference was noted in the age-standardized rates: about 11 vs. 8 (deaths per 100,000 population), respectively. Furthermore, the crude mortality rate from chronic kidney disease attributable to hypertension was two times higher in 2019 compared to 1990 (about 3.3 vs. 1.6 deaths per 100,000 population, respectively). Conversely, the age-standardized mortality rate from chronic kidney disease due to hypertension decreased in 2019 compared to 1990 (2.2 vs. 3.0 deaths per 100,000 population, respectively) (Table 1).

At a crude level, the proportional mortality from acute glomerulonephritis was higher in 1990 than in 2019 (0.09% vs. 0.01%, respectively), whereas an opposite finding was evident for chronic kidney disease (1.38% vs. 1.45%, respectively) and its share attributed to hypertension (0.3 vs. 0.4, respectively).

A similar pattern was evident for the burden of kidney diseases (expressed in DALYs) (Table 1), which resembled the trend of mortality rates. Hence, the burden of acute glomerulonephritis in 1990 was higher than in 2019 for both crude (21.2 vs. 1.4 DALYs per 100,000, respectively) and age-standardized (22.6 vs. 1.3 DALYs per 100,000, respectively) estimates. At a crude level, the burden of chronic kidney diseases in 1990 (characterized by a much younger population) was lower than in 2019 when the Albanian population was much older (286 vs. 363 DALYs per 100,000, respectively), whereas an opposite finding was evident for the age-standardized estimates (359 vs. 278, respectively). Likewise, the age-standardized burden of chronic kidney disease due to hypertension in 2019 was lower than in 1990 (about 50 vs. 64 DALYs per 100,000) (Table 1).

As for the share of disease burden, in 2019, acute glomerulonephritis accounted for 0.01% of all DALYs, chronic kidney disease for around 1.3% of overall DALYs, and chronic kidney disease due to hypertension constituted about 0.3% of all DALYs in the Albanian population (Table 1).

In 1990, the crude mortality rate attributable to kidney dysfunction in Albania was lower than in 2019 (Table 2) due to the demographic differences between these two time periods (about 19 vs. 52 deaths per 100,000 population), whereas the age-standardized estimates were fairly similar (about 34 deaths per 100,000 population). Given the population aging, the proportional all-cause mortality due to kidney dysfunction was higher in 2019 than in 1990 (crude estimates: about 6.3% vs. 3.7%, respectively). Regarding the disease burden, at a crude level, the all-cause burden due to kidney dysfunction was almost twice as high in 2019 compared to 1990 (1015 vs. 527 DALYs per 100,0000, respectively) (Table 2). Conversely, the age-standardized burden due to kidney dysfunction was lower in 2019 compared to 1990 (695 vs. 768 DALYs per 100,000, respectively). As for the proportional burden, the share of the all-cause burden due to kidney dysfunction in 2019 was twice as high as in 1990 (3.6% vs. 1.8%, respectively). Upon age-standardization, this difference was attenuated (3.0% vs. 2.3%, respectively) (Table 2).

Table 1. Selected kidney disease indicators in Albania in 1990 and 2019

INDICATOR	Crude		Age-standardized	
	1990	2019	1990	2019
Acute glomerulonephritis (deaths per 100,000 population)	0.48	0.05	0.65	0.04
Chronic kidney disease (deaths per 100,000 population)	7.27	12.09	11.53	8.24
Chronic kidney disease due to hypertension (deaths per 100,000 population)	1.62	3.35	3.01	2.18
Acute glomerulonephritis (proportional mortality in %)	0.09	0.01	N/A*	N/A
Chronic kidney disease (proportional mortality in %)	1.38	1.45	N/A	N/A
Chronic kidney disease due to hypertension (proportional mortality in %)	0.31	0.40	N/A	N/A
Acute glomerulonephritis (DALYs per 100,000)	21.19	1.42	22.63	1.30
Chronic kidney disease (DALYs per 100,000)	285.9	362.7	358.6	278.3
Chronic kidney disease due to hypertension (DALYs per 100,000)	40.91	74.98	64.18	50.34
Acute glomerulonephritis (proportional DALYs in %)	0.07	0.01	N/A	N/A
Chronic kidney disease (proportional DALYs in %)	0.99	1.29	N/A	N/A
Chronic kidney disease due to hypertension (proportional DALYs in %)	0.14	0.27	N/A	N/A

(source: IHME - https://vizhub.healthdata.org/gbd-results/); * N/A: estimates not available.

Table 2. Attributable mortality and burden of disease to kidney dysfunction in Albania in 1990 and 2019

INDICATOR	Crude		Age-standardized	
	1990	2019	1990	2019
All-cause mortality (deaths per 100,000 population)	19.39	52.16	34.8	34.4
All-cause mortality (in %)	3.67	6.26	4.18	5.98
All-cause DALYs (per 100,000)	527.0	1014.6	768.4	695.5
All-cause DALYs (in %)	1.82	3.60	2.33	3.05

(source: IHME - https://vizhub.healthdata.org/gbd-results/)

Figure 1 presents the proportional mortality attributable to kidney dysfunctions vis-à-vis other selected risk factors in the Albanian population. Upon age-standardization, the proportional mortality due to kidney dysfunction in 1990 was about 4.2% compared with 6.0% in 2019. The main single risk factor for the overall mortality in Albania in 2019 was high systolic blood pressure, constituting about one-third of all deaths in the Albanian population. On the whole, behavioural risks accounted for about 45%-46% of the overall mortality either in 1990 or in 2019. At an age-standardized level, the share of other risk factors accounted for about one-fifth of the overall mortality of the Albanian population in 1990 and 2019 (Figure 1).

5. Discussion

This analysis provides summarized information about selected kidney diseases in Albania for the period 1990-2019. The main findings of this analysis include a reduction in the past three decades in the mortality rate and burden of acute glomerulonephritis in the Albanian population. On the other hand, at a crude level, chronic kidney disease and its share attributable to hypertension exhibit a gradual increase from 1990 to 2019, which is logical given the constant population aging in Albania in the past decades. However, the age-standardized mortality rate and burden of chronic kidney disease were lower in 2019 than in 1990, a finding which points to a gradual improvement regarding the prompt detection and effective treatment and control of this condition.

Kidney diseases constitute a significant health challenge at a population level due to the following reasons:

- the high prevalence especially of chronic kidney disease [6], which affects all age groups and both sexes, but is more prevalent in aged individuals [10]. This condition is a worldwide public health problem associated with impaired quality of life and substantially reduced life expectancy at all ages [5] and exhibits excess risks for cardiovascular disease and other conditions such as diabetes, infection, and cancer [11];
- the healthcare burden associated with their management which requires extensive resources (including regular monitoring, medication, dialysis, or even kidney transplantation) [6,10,11];
- the negative impact on the quality of life including the presence of such symptoms as fatigue, swelling, difficulty concentrating, and increased risk of cardiovascular diseases [5,6];
- increased risk of morbidity and mortality due to kidney diseases, economic impact on individuals, families, and societies [5,6].

Therefore, given these factors, kidney diseases represent a significant public health challenge that requires attention at both the individual and population levels to improve outcomes and reduce the burden on healthcare systems and societies as a whole.

Although the share of mortality attributable to kidney dysfunction in the Albanian population is relatively small (about 6% in 2019), this is a significant risk factor which affects considerably the quality of life. On another note, high systolic blood pressure is currently the main risk factor for all-cause mortality in the Albanian population. Despite this, awareness about the control and prevention of hypertension in the Albanian general population is very low [12].

According to the estimates related to health determinants which are provided by IHME, the five most important risk factors for morbidity and mortality in the Albanian population include high blood pressure, dietary risks, smoking, overweight and obesity, and hyperglycaemia (high sugar level) (8). This pattern related to risk factors in Albania differs from the Western prototype of risk factor distribution and resembles the pattern pertinent to developing and transitional countries, where hypertension is the main risk factor for ill health (8).

On a specific note, the incidence, prevalence, and specific patterns of kidney diseases in Albania, likewise in many other countries, may be influenced by various factors such as demographic changes, socioeconomic status, healthcare infrastructure, access to healthcare, environmental factors, and genetic predispositions. In any case, controlling kidney diseases at a population level in Albania is essential for improving public health, reducing healthcare costs, preventing complications, promoting early detection and intervention, addressing health disparities, and promoting healthy behaviors. From this

point of view, there is a need for policymakers and decision-makers in Albania to implement comprehensive strategies and programs that target the entire population, but especially individuals who are at a higher risk for the development of various kidney diseases. Such targeted control and prevention programs can lead to significant progress in reducing the burden of kidney diseases and improving the health and well-being of the Albanian population.

Our analysis may have limitations, as the validity of some health indicators may be restricted, especially for a country such as Albania whose health information system needs too much to be desired. Hence, in the absence of reliable and comprehensive data, the assumption of homogeneity (application of uniform risk estimates) applied by GBD studies may not reflect the true relationship between selected risk factors and health outcomes [13,14]. Furthermore, the information available from IHME includes only two conditions namely acute glomerulonephritis and chronic kidney disease. On the other hand, there is no available information about some other important kidney diseases such as acute kidney injuries, polycystic kidney disease, nephrotic syndrome, kidney stones (nephrolithiasis), urinary tract infections, or diabetic nephropathy. In addition, there are many other kidney diseases and conditions that can affect kidney function and health. Hence, the IHME source does not provide a comprehensive measurement of all kidney diseases in the Albanian population, but only for selected kidney conditions.

Despite these limitations, our analysis summarizes valuable information about the mortality rate and burden of kidney diseases in Albania, a post-communist country in Southeastern Europe.

6. Conclusions

In summary, based on the estimates provided by the IHME, we obtained evidence of a reduction in the mortality rate and burden of acute glomerulonephritis in the Albanian population in the past three decades. Furthermore, in line with the gradual population aging in Albania, chronic kidney disease and its share attributable to hypertension exhibited a gradual increase at a crude level from 1990 to 2019, whereas the age-standardized estimates were lower in 2019 than in 1990.

In conclusion, this analysis provides useful information about the trends of kidney diseases in the general population of Albania, a country characterized by a particularly rapid process of political and socioeconomic changes in the past few decades.

Conflicts of Interest

None declared.

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