Preventing end-stage renal disease: the potential impact of screening and intervention in developing countries

Arrigo Schieppati1,2, Norberto Perico1 and Giuseppe Remuzzi1,2

1Mario Negri Institute for Pharmacological Research, Negri Bergamo Laboratories, Bergamo and 2Ospedali Riuniti di Bergamo, Division of Nephrology and Dialysis, Bergamo, Italy

Keywords: developing countries; end-stage renal disease; renal replacement therapy; screening

There are about 1 million people in the world that are alive just because they have access to one form or another of renal replacement therapy (RRT) [1]. Ninety percent of them live in the developed countries, or, as they are defined by the World Bank (WB), high-income countries, where the average gross income is in excess of $10 000 per capita.

There is a clear, direct relationship between gross national product (GNP) and availability of RRT. Dialysis treatment absorbs 0.7 to 1.8% of the health care budget in European countries, while the dialysis population represents 0.02 to 0.05% of the whole population [2]. In the Eastern European countries, the so-called former Soviet block, the prevalence rate of RRT is half or less than in countries of the European Union; also the average GNP in those countries is half or less than in Western Europe [3,4]. It is hard to believe that the epidemiology of renal diseases differs that much in the two areas of Europe.

Simply put, RRT is so costly that there is minimal probability for the vast majority of the world’s population to take advantage of it.

The future perspectives are gloomy. A forecast analysis predicts that in 10 years there will be 2 million people on RRT, and even developed countries will be strained by the rising costs [1].

The major causes of end-stage renal disease in North America and in many developed countries are diabetes and hypertension, which together account for almost 60% of dialysis patients [5]. On the other hand, high blood pressure and diabetes mellitus contribute in a significant way to the rising burden of global morbidity and mortality associated with cardiovascular diseases. The prevalence of both conditions is rising significantly not only in developed countries, but also in developing ones [6]. The shift from an active life as farmers to a less-active lifestyle associated with urbanization, and an increased consumption of sugar and fat, are among the factors responsible for the rise of obesity and related diseases [6].

Data gathered from clinical studies and randomized trials in developed countries have demonstrated that prevention of progression of cardiovascular and renal diseases is feasible. Reduction of high blood pressure and proteinuria with angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, control of blood glucose and lipids, along with non-pharmacologic measures, such as smoking cessation, physical activity, and body weight control, offer an indisputable protection against cardiovascular and renal diseases [7].

The Commission for the Global Advancement of Nephrology (COMGAN) of the International Society of Nephrology, established in 1993, has focused its attention on education and training of staff in developing countries and has developed the Renal Sister Center Program. A COMGAN Research Committee has been established with the general aim to provide opportunities for research in emerging countries in which Western expertise can be applied to local problems.

We believe that, with some effort, prevention of the progression of renal disease with the combination of pharmacologic and non-pharmacologic approaches can be exported to less-developed countries. Screening programs can be implemented with simple, cheap, and reliable tests, such as measurement of body weight, blood pressure, blood glucose, and dipstick urinalysis for protein. Examples already exist. In India [8] and Bolivia [9] a large number of people can already be screened with affordable means.

The impact on renal and cardiovascular morbidity and mortality of relatively simple measures, such as blood pressure reduction, good glycaemic control, and smoking cessation, is great and significant at any targeted level reached [10]. Moreover, quite soon drug patents should expire for antihypertensive agents that have specific protective effects against both renal and cardiovascular diseases, such as angiotensin-converting enzyme inhibitors, making it feasible to implement...
more vigorous preventive programs even in less favourable settings. Indeed, a pilot program has been conducted in an Australian Aboriginal community [11]. A systematic treatment program, combining blood pressure reduction and improved glucose and lipid control with health education, was associated with an improvement in clinical profile and mortality.

This is exactly the real mission of the COMGAN Research Committee: the translation of the results of clinical research into clinical practice on a global basis, rather than only in those parts of the world where the data have been obtained.

To this purpose, multiple actions have to be taken. Education and training of health professionals is the first priority. A comprehensive training program for physicians and nurses should be established and carried on in selected institutions in developed countries, like a sort of ‘global nephrology fellowship’. The program should give priority to topics such as epidemiology, development of screening and treatment protocols, and data handling. It is important to underscore that health professionals should receive rigorous training to allow them to return to their countries and start the program.

The implementation of such an ambitious program cannot be realized without the involvement of international agencies such as the World Health Organization (WHO) and WB. Actually, during the last year, the issues of the global renal and cardiovascular disease burden have been the objects of formal presentations at the WHO and WB, where there has been keen interest and appreciation.

At the local level it is important to establish contacts with national scientific societies. Such contacts are indispensable tools for the health authorities and the national governments.

Since ultimately the realization of the program requires equipment and medicinal products, partnership with the pharmaceutical industry is of paramount importance. Diagnostic devices and drugs for treating hypertension, high blood cholesterol, and glucose should be donated or at least offered at affordable prices to low-income countries where prevention programs are implemented. The pharmaceutical industry has produced many drugs that have benefited the human species. However, this has also been a most profitable enterprise. As we have written elsewhere, ‘...the industry’s impact on public health is so great, and the subsidies and protections offered by governments so generous, that the industry should consider its social responsibilities and not just its profits’ [12]. We propose that a very small fraction of industry's impact on public health is so great, and the subsidies and protections offered by governments so generous, that the industry should consider its social responsibilities and not just its profits’ [12].

We propose that a very small fraction of industry's impact on public health is so great, and the subsidies and protections offered by governments so generous, that the industry should consider its social responsibilities and not just its profits’ [12].

References

2. De Vecchi AF, Dratwa M, Wiedemann ME. Healthcare systems and end-stage renal disease (ESRD) therapies—an international review: costs and reimbursement/funding of ESRD therapies. Nephrol Dial Transplant 1999; 14 [Suppl 6]: 31–41