

Prevention of Non-Communicable Diseases: What can be done?

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This issue of *AIM* focuses on studies from Isfahan Cardiovascular Research Institute. This institute is a pioneer of research on lifestyle modification for prevention of cardiovascular disease (CVD) in middle-east.¹

During the last few decades, most developing countries have witnessed noticeable improvements in general health. Infectious diseases, formerly the prime reason for mortality, are becoming less and less common leading to significant improvements in various health indexes such as infant mortality rate and life expectancy. The life expectancy at birth in Iran has rose to above 73 years in 2010.²

With the relative control of infectious disease, non-communicable diseases (NCD) are gaining more and more importance as the major cause of decreased life expectancy.³ NCD already account for over 70% of the mortality observed in Iran and many other low- and middle-income countries (Table 1).⁴

Cardiovascular and Cerebrovascular disease (myocardial infarction and stroke) by far constitute the most common cause of NCD mortality.³ In this issue of *AIM*, Talaei, et al. report the cardiovascular mortality rate observed during 32,893 person-years of follow-up in Isfahan Cohort Study. They observed a CVD mortality rate of 331 per 100,000 person-years in men and 203 in women which is alarmingly high.⁵

Similarly high rates have been reported from many other countries, whether developed or not, low- or high-income, western or eastern. The UN has recognized the threat of NCD for social and economic development as an urgent matter requiring long-term health planning throughout the world.⁶ Unfortunately in our country too, as many other low- and middle-income countries, NCD has not received the attention it deserves.⁷

How can we confront NCD?

Obviously we should start from the most common cause; CVD. Treating CVD, once established, is quite resource-intensive and the cost of treatment is rising steadily as more advanced and complicated technologies are being developed. It would be very difficult, if not impossible, to keep up with these expenses even for the most high-income countries. As usual, prevention is the only viable option.

The risk factors for CVD are well known. Hypertension, hyperlipidemia, obesity, diabetes and smoking are among the most extensively studied. A few such studies are published in this issue of *AIM*. Interestingly, the same factors are also involved in other NCD such as chronic renal disease, chronic respiratory disease and chronic liver disease. It follows that handling these risk factors might be our best chance of controlling NCD. A few approaches come to mind, each of which has its potential advan-

tages and drawbacks.

Life style modification is probably the best way to prevent or ameliorate many CVD risk factors.⁸ Weight loss in obese subjects, regular exercise, limiting salt intake and quitting smoking are the most effective. Unfortunately long-term life style modification is very difficult to achieve, especially in older ages.^{9,10} The success of life style modification requires nation-wide commitment. Not only the ministry of health but at least the food industry, the media, ministry of education and municipalities should be involved.¹⁰ Exercise and weight loss should be actively advertised, food should be monitored for quality, salt restriction and healthy diets should be promoted from elementary school and so on. Implementing this approach requires considerable resources and nation-wide political commitment. Even with correct policies, it would take decades before recognizable effects are discernible.¹¹

Identifying and treating risk factors such as hypertension or hyperlipidemia, before they result in irreversible damage is another promising option. This would require screening the at-risk population at regular intervals. Such an approach would require resources that are not readily available in rural areas. The health care system in Iran takes advantage of community health-care workers (CHW) who are selected local people trained to monitor infant and mother health. The result of their work has led to a remarkable improvement in infant mortality rate in Iran.¹² Further training of CHW and a carefully designed guideline can lead to early identification of at least a few important risk factors, not the least of which is hypertension.¹³ After identifying high-risk conditions, subjects should be referred for medical management, again demanding resources that might not be easily available. We are already studying a minimalistic approach in north Iran.¹⁴

About 10 years ago, in a paper published in the *British Journal of Medicine*, Wald and Law demonstrated that a combination of low-dose aspirin, statins and a few antihypertensives (the Polypill) when given to average-risk subjects might be able to reduce CVD up to 80%.¹⁵ Taking a single daily dose of a single pill, which would be very cheap in mass production, might be more cost-effective in preventing CVD than any of the other two approaches mentioned above. Sepanlou, et al. have shown that we can expect a reduction of 50% in CVD and 43% in stroke by using Polypill for adults above 55 in Iran.¹⁶ The advantage of the Polypill is that it can be easily managed by CHW following a carefully developed guideline and a short training. In Iran, the infrastructure of health-care workers is already in place thus the Polypill concept appears very attractive. We have already developed a Polypill and have used it in a pilot study and are now testing it in a larger population.^{14,17}

Which of the above approaches is used depends on the infrastructure and resources available to each country. Careful studies

Table 1. Causes of death in Golestan Cohort Study until December 2012*

Cause of Death	%
Cardiovascular disease	34.4
Cancer	21.8
Cerebrovascular disease	16.5
Respiratory diseases	5.0
Traffic accidents	4.1
Renal diseases	2.7
Infectious diseases	2.6

* Updated data from Pourshams et al.⁴

and cost-effectiveness analysis should be performed. Each of the above approaches should be considered and most probably a combination of all three should be practiced in each instance. It is quite possible that the best approach for rural population might not be as good for urban subjects. Even different age-groups might have different solutions. The same goes for different sexes. It is obvious that a tremendous amount of research would be required to identify the ideal approach. Such research would be time and resource consuming and when concluded, the results - while valid for the research subjects - might not necessarily apply to the next generation. Thus too much detail should be avoided and pragmatic studies should be performed.

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