

Future of research in hypertension in developing countries*

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مستقبل بحوث إرتفاع ضغط الدم في البلدان النامية

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خلاصة : تحدث الآن تغيرات كبيرة في المشهد الصحي لمديد من البلدان النامية . فمأمول العمر يرتفع في هذه البلدان ، وقد أصبح الناس أكثر عرضة للإصابة بأمراض المسنين مثل ارتفاع ضغط الدم والأمراض القلبية الوعائية . إن البحث العلمي في العالم النامي - بما في ذلك هذا المجال - لا يزال متأخرا . ومع ذلك فبالإمكان إجراء بحوث جيدة برغم قلة الموارد . وهذه المقالة تحدد العوائق المادية والنفسية التي تواجه البحث العلمي . وتؤكد أن البحوث الوبائية والسرييرية تمثل أولويات متقدمة بين البحوث التي تتناول ارتفاع ضغط الدم في البلدان النامية . كما أن للتعاون الدولي أهمية أساسية لزيادة تفهم ارتفاع ضغط الدم .

ABSTRACT Major changes in the health profile of many developing countries are taking place. Life expectancy in these countries is increasing, and people are more exposed to diseases of old age like hypertension and cardiovascular diseases. Scientific research in the developing world—including this area—is lagging behind. However, high-quality research can still be carried out in spite of the limited resources. This paper identifies the different material and psychological barriers to scientific research. Epidemiological and clinical research represent high priorities in hypertension research in developing countries, and international cooperation is essential to improve the understanding of hypertension.

L'avenir de la recherche sur l'hypertension dans les pays en développement

RÉSUMÉ Des changements importants se produisent actuellement dans la situation sanitaire de nombreux pays en développement. L'espérance de vie augmente dans ces pays et les populations sont plus exposées aux maladies de la vieillesse telles l'hypertension et les affections cardio-vasculaires. La recherche scientifique dans les pays en développement—notamment dans ce domaine—accuse un retard. Cependant, des travaux de recherche de qualité peuvent être réalisés même avec des ressources limitées. Cet article recense les différents obstacles matériels et psychologiques à la réalisation de travaux de recherche scientifique. La recherche dans les domaines épidémiologique et clinique constitue une priorité importante dans la recherche sur l'hypertension dans les pays en développement et la coopération internationale est essentielle pour mieux comprendre l'hypertension.

*Presented at the First Joint Meeting of the Egyptian Hypertension Society and World Hypertension League, Cairo, 13 December 1995.

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The increasing importance of hypertension

There can be no doubt that we are witnessing major changes in the health profile of many developing countries. The control of many infectious and parasitic diseases and the sharp decline in infant mortality have increased the average life expectancy in these countries. Since people live longer, they are exposed to diseases of old age such as hypertension and cardiovascular diseases.

Trends in Egyptian statistics indicate that the main causes of mortality shifted in Egypt between 1970 and 1989. It is believed that the situation they reveal exists in many other developing countries. Furthermore, the results of the Egyptian National Hypertension Project showed that hypertension is extremely common among Egyptians.

Cardiovascular diseases are now the main cause of death, being responsible for 42.5% of all deaths, while 20 years earlier they accounted for only 12.4% of mortality [1]. Statistics from the Egyptian Ministry of Health show that there is an increase in life expectancy. Over the past three decades it increased for males from 51.5 to 62.8 years and for females from 53.8 to 66.4 years [2]. Furthermore, the results of the Egyptian National Hypertension Project showed that hypertension is extremely common among Egyptians. It is believed that the situation they reveal exists in many other developing countries.

Comparing the prevalence of hypertension in three countries, China, Egypt and the USA, using the same definition of hypertension, Egypt has the highest prevalence rate among the three countries; according to the National Hypertension Project data [3] 26% of adult Egyptians suffer from high blood pressure.

Situation of scientific research in the developing world

Data published in the August 1995 issue of *Scientific American* [4] indicated that in the share of mainstream journal articles, countries such as Bulgaria, Egypt and Turkey each accounted for less than 0.3% of the total contributions for all nations. With regard to the percentage of submissions accepted, the number of articles submitted to *Science* from 12 developing countries and the number accepted in the years 1990 to 1994 show a very discouraging situation. Although the number submitted almost doubled in that period the number accepted remained almost the same: less than 1.5%.

To understand the reasons behind this situation, the different barriers to scientific research in the developing world need to be identified. They can be classified into material and psychological barriers. Material difficulties include lack of funds for research and poor access to literature. Many countries lack infrastructure in the form of equipment and up-to-date technology, beside having a limited number of trained and experienced personnel. The major problem, however, is the lack of complete and accurate data and the absence of quality assurance measures.

Psychological barriers involve individuals, government agencies and private organizations and may be clarified by the statement of the editor-in-chief of the *New England journal of medicine*: "Very poor countries have much more to worry about than doing high-quality research" [4]. On the contrary, however, in spite of the limited resources developing countries can still do high quality research; a good example is the Egyptian National Hypertension Project.

Priorities in hypertension research in developing countries

Epidemiological research

The first priority in epidemiological research is to define the magnitude of the hypertension problem in an individual country. The majority of developing countries have no national estimates of the prevalence of hypertension.

Secondly, the susceptible groups in the nation have to be identified, i.e. who is most likely to develop the disease. It is important to know the prevalence among different age groups, geographic areas, socio-economic classes and the influence of factors like gender, ethnicity, etc.

Thirdly, hypertension risk factors, such as obesity, type of body fat distribution, excessive salt intake, deficiency in minerals such as potassium, magnesium and calcium, excessive alcohol intake, psychosocial stress, low levels of education, ethnicity and sedentary lifestyle, should be recognized and their prevalence in the nation and how closely they are related to blood pressure level should be examined. In some countries there are unusual hypertension risk factors, such as schistosomiasis in Egypt which has been linked to hypertension through its effect on the urinary tract [5]. Environmental pollution, in the form of excessive noise [6,7], or lead pollution [8] may contribute to the rise of blood pressure in some communities. Methods need to be developed to modify these risk factors at the national level.

Other questions in epidemiological research include the type and prevalence of hypertensive cardiovascular complications. These might be influenced by environment, ethnicity and other demographic characteristics. It is important to identify the groups which are most vulnerable to complica-

tions. How closely are these complications related to blood pressure level and what other mechanisms are involved? Methods need to be developed for the early detection of complications.

Primary prevention of hypertension is possible through weight reduction, regular exercise, alcohol moderation, salt restriction and other dietary measures [9]. It is important to identify groups where a particular intervention is more effective, e.g. salt restriction in the elderly, weight reduction in the young and middle-aged, potassium supplementation in blacks. It is necessary to know what the optimal lifestyle intervention is and to define the best approaches and their impact on incidence of hypertension and its control. Finally, methods have to be developed to improve detection and control of hypertension. This is especially important in developing countries with high illiteracy rates. Data from the Egyptian National Hypertension Project showed that only 37.5% of hypertensives, were aware of having high blood pressure, 23.9% were receiving treatment and 8% had their blood pressure controlled [3].

Clinical research

There are a number of unsolved issues in the clinical field which require further research:

- number of blood pressure measurement readings required and length of period of observation required before classifying an individual as being hypertensive;
- the role of ambulatory blood pressure;
- optimal blood pressure reduction and the desired level of blood pressure since it is not necessarily the same in all individuals. Ethnicity, age and sex may influence target blood pressure and a more aggressive reduction in blood pressure may be needed in some groups, e.g. diabetics, blacks and patients with end organ damage;

- first-line drugs to be used.

A multicentre study is planned in Egypt in order to examine the risk-benefit ratio of different antihypertensives and the place of new antihypertensive agents. The study addresses a very important question in developing countries with limited financial resources: are these expensive drugs necessary or not?

International cooperation

It is important to stress the value of cooperation between developing and developed

countries in future hypertension research. Joint research projects should be encouraged, especially in the area of epidemiological research. Developed countries can share in funding and expertise while developing countries can contribute data and scientific information that will improve the understanding of hypertension. The Egyptian National Hypertension Project is a good example of such international joint cooperation between the governments of Egypt and the United States of America [10].

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