Commentary

“Early” Essential Hypertension, Prevention, Intervention

MARY JANE JESSE, M.D.

E ARLY in the last decade, studies of coronary disease risk factors in populations of children began. Intrinsic to these studies was the question as to whether children destined to become hypertensive as adults could be identified. This question, addressed in the preceding paper, is clearly an important one, and further research should be directed toward delineating predictability of blood pressure levels.

The body of information collected during the past 10 years, however, does not provide a clear answer to the question. In fact, the data do not permit assignment of the risk of being hypertensive 30 years hence in any population of children. Indeed, the childhood population data do not permit prediction of a future blood pressure level in any individual child.

Hypertension was determined to be a risk factor for cardiovascular disease by a study of the distribution of cardiovascular disease, hypertension, and its frequency in various populations of adults. When present, this “risk factor” means that the “risk” of coronary heart disease or stroke is higher than it would be if hypertension were absent. If one examines those adults who are in the highest quintile for all three major risk factors, as Dr. Michael Oliver has pointed out in the New England Journal of Medicine, 39.6% of the adults can be expected to have coronary heart disease during the period between ages 40 and 64 years. The percentage decreases when only one risk factor is present. In the case of the population in the highest quintile for all three risk factors, 60.4% will not experience coronary artery disease between the ages of 40 and 64 years.

It is not possible, with our current state of knowledge, to determine which individuals with hypertension will belong to the group that will experience a coronary event, or for that matter which persons will escape such an event. If the incidence of coronary artery disease drops in the United States, the magnitude of the risk will also drop.

Even though a minority of adults with an identified risk factor will suffer coronary artery disease, it is clearly prudent to intervene with the adult hypertensive patient. He or she has an abnormal physical finding in addition to a risk factor, and may become one of the minority who will die of coronary disease.

The physician who treats the adult with hypertension, particularly the patient with mild hypertension, defined as a diastolic pressure of 90 to 105 mm Hg, must carefully weigh the risks of intervention vs the risks of such mild elevations of blood pressure. The physician must decide whether the risks of impotence, hyperuricemia, gout, impaired glucose tolerance, and peripheral circulatory disorders associated with current long-term drug therapy are greater than the risk of coronary disease. As has been recently recommended, he or she may prefer to prescribe lifestyle changes.
including weight loss, reduction of salt intake, cessation of cigarette smoking, and a physical exercise program.\(^1\)

These are difficult decisions when treating an adult with mild hypertension. How much more difficult then, must the decision be, to treat a child who may 30 years hence have mild hypertension, and who may fall into the minority of individuals who will experience coronary artery disease after the age of 40. All of the drug risks apply to children. One must add to those risks the unknown impact of long-term drug therapy on the growth and development of the child.

In most studies of childhood populations, the correlation between an initial blood pressure and one taken 2 years hence does not reach the adult level of 0.6 until approximately 18 to 20 years of age.\(^2\) Thus, in adults only approximately 40% of the variance is explained.\(^3\) In effect, the predictability of blood pressure levels in adults is markedly limited.

In the paper, “A Model of Intervention for Prevention of Early Essential Hypertension in the 1980s,” reference is made by the authors to “a mathematical adjustment for artifacts due to within-child variability.” Despite this “mathematical adjustment,” which attempts to correct for regression to the mean and thus the “intrachild variability,” the correlation for systolic blood pressure levels was 0.52 and 0.36 for diastolic pressure.\(^4\)

The issue is further compounded by the use of a calculated “mean blood pressure” rather than systolic or diastolic levels. Obviously a high systolic blood pressure with a normal diastolic pressure would produce an “elevated” mean level. Such a “mean blood pressure level” has not been indicted as a risk factor.

One of the major misunderstandings regarding epidemiological studies of populations has been the perception that causes of disease described in large populations can be used to predict disease in an individual. The risk may be described; a certain outcome in the inception that causes of disease described in large populations will reduce the risk.\(^5\) It is generally accepted that intervention on such whole populations will reduce the risk.

In the case of coronary artery disease, changing the lifestyle, cessation of smoking, salt intake reduction, elimination of obesity will almost surely reduce the risk in the general population. It is generally accepted that the circumstantial evidence is strong to support such recommendations. However, it is not yet possible for a physician to tell an adult with a given set of risk factors that he or she will have a heart attack or a stroke.

Internists and epidemiologists are expressing concern about the enthusiasm for identifying individuals with apparent increased risk, and starting such individuals on long-term regimens with drugs to reduce the risk.\(^6\) As Oliver points out, there is a world of difference between removing a risk factor such as cigarette smoking and adding a new, unknown risk such as prescribing a drug.\(^7\) His statement that aggressiveness in drug prescription should be inversely proportional to age is particularly applicable to the intervention recommended by authors of the preceding paper.

The proposal to intervene with drugs in children whose blood pressure levels today may have no bearing on their levels at age 40 is of greater concern than the current worry of internists regarding use of drugs in adults with mild hypertension.

With these considerations in mind, the reader of the preceding paper must decide as to the wisdom, and the attendant risks, of the proposed intervention. As Thoreau pointed out, “Some circumstantial evidence is very strong, as when you find a trout in the milk.”\(^8\)

As regards to drug therapy for children who by definition fall into the normal distribution for blood pressure and age, there is no circumstantial evidence that indicates the propriety of such intervention.

In the adult population there is at least a bottle of milk. There is no certainty yet as to whether a trout can be seen swimming in it.

References
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M J Jesse

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