Workshop Report

Highlights of an international workshop on abdominal aortic aneurysms*

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Aneurysms are the 13th leading cause of death in the United States,[1] and the incidence of abdominal aortic aneurysms (AAAs) is apparently rising.[2-4] AAA is a poorly understood but important clinical problem, and there is a critical need for research directed toward several aspects, including cause, epidemiologic features and management.

Many AAAs go undetected until they rupture. The death rate associated with ruptured AAA is high: about 50% of patients die before reaching hospital, and a further 24% die before an operation can be performed.[5] Elective repair, on the other hand, carries a death rate of less than 5%, and associated complications such as limb loss and renal failure are uncommon. The risk of AAA rupture is related to the aneurysm's size[6] and symptoms.[7] Asymptomatic AAAs measuring 5 cm in maximal transverse diameter have a yearly incidence rate of rupture of 4.1%, but with a maximum transverse diameter of 7 cm the rate is 19%.[5] At present, rupture occurs in a substantial proportion of affected subjects. Baird and colleagues,[7] for example, reported that 24% of the AAAs treated at Toronto Western Hospital were ruptured at the time of presentation, and in the Mayo Clinic's experience 20.3% presented with a rupture.[8] These figures do not take into account patients who died before arrival at hospital or were treated at community hospitals in the area, so the total experience in the community may be difficult to judge on the basis of these observations alone. Differences between regions and hospital practices make reports of the results of treatment of AAA difficult to compare, and as a rule such reports make no attempt to address the issue of rupture prevention.

The prevalence of AAA in our community is uncertain without a formal population study, which has not been done. A number of factors may be important, including the ratio of males to females, the age of the population at risk and the presence of known risk factors for cardiovascular disease. Genetic factors may have an effect,[9] particularly in stable populations where the genetic pool is small and inherited characteristics are more prevalent. As a rule, surgery is not recommended for an AAA unless it is at least twice the diameter of the proximal aorta. In men aged 65 to 74 years aortic diameters average 2.0 cm.[10] Reconstruction is generally recommended when the size reaches 5 cm or more. Therefore, knowing the prevalence of AAA without knowing the size or rate of expansion will not permit more specific recommendations to be made.

Diagnosis has improved steadily with developments in noninvasive imaging methods, and, as

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well, there is a more general awareness of AAA among family practitioners. However, in a substantial number of patients AAAs go unsuspected and undiagnosed until rupture occurs, despite a recent physical examination in many cases.[10] An AAA is analogous to a "U-boat inside the belly"; both may be silent yet discernible by means of ultrasonography.[11]

Despite a well-defined clinical description of AAAs, there is debate over many important aspects and uncertainty about the role of such factors as genetic predisposition,[9] biochemical alterations in the aortic wall[12] and the interplay between putative internal and external risk factors.[13]

Ottawa workshop

To facilitate and promote research in this field a workshop was held by the Division of Vascular Surgery, University of Ottawa, and the University of Ottawa Heart Institute Jan. 20 to 21, 1989, in Ottawa. The intent was to bring together a cross-section of the scientific community with appropriate expertise to address the subject of AAA and to make recommendations about research strategies directed at the following general goals.

- To determine the magnitude of the problem in the community and the types of epidemiologic studies needed to establish the prevalence of AAAs, the risk factors associated with their development and predictors of rapid expansion and rupture.
- To characterize the development of AAA and the biologic features of arteries affected by aneurysmal degeneration.

The format of the workshop included a brief overview of definitions, presented by Dr. K. Wayne Johnston, discussion by Dr. M. David Tilson of a number of hypotheses about the development of AAAs and discussion by Dr. Gerry Hill of the range of epidemiologic studies that might be brought to bear on the topic. Participants were then assigned to one of three subgroups with an agenda covering the following basic questions.

- How should AAA be defined?
- What database is needed to address the epidemiologic issues associated with AAA? Are there alternative databases?
- What studies would be practical in attempting to define the incidence and prevalence of AAA?
- What collaboration is necessary to bring together multicentre studies? Should these be national or international?
- What studies are needed to identify risk factors associated with the development of AAA?
- Should high-risk groups be screened? How can high risk be determined? How can the value of screening be tested?
- Are there biologic markers for AAA? How should we test the hypothesis that some markers may be predictors for AAA?
- What are the sources for long-term funding for these types of studies?

A plenary session brought the recommendations of the groups together, and these were further refined into a consensus.

Recommendations

The following priorities for research were identified.

- To determine the natural history of small AAAs.
- To identify risk factors for AAA development and for rapid growth.
- To establish the value of screening (with ultrasonography) in certain high-risk populations.
- To characterize the development of AAA.
- To model the hemodynamic and hydraulic factors associated with rapid AAA growth.

Specific recommendations were as follows.

- Uniform standards for reporting cases should be adopted for all future studies. These are being drawn up by the joint Ad Hoc Committee on Reporting Standards of the Society for Vascular Surgery and the North American chapter of the International Society for Cardiovascular Surgery. The final suggested standards will be available later this year.
- An organizing group should be formed to develop multicentre protocols.
- A case–control study to identify the risk factors for AAA is the first study that should be carried out by this group. Follow-up of cases (patients known to have AAA) and controls (people known not to have AAA) would allow identification of prognostic factors for survival after diagnosis of AAA. A randomized treatment trial to assess the management of small AAAs is the second protocol that should be developed.
- Some participants in these protocols who are interested in the genetic aspects of AAA should form a subgroup to pool their data on inherited predisposition to AAA.
- The value of screening people at high risk for AAA by means of ultrasonography needs to be assessed with a randomized trial.

Summary

There is a growing appreciation of the magnitude of the problem of AAA in all Western countries. The large numbers of subjects needed to answer some of the questions, such as the natural history of small AAAs and risk factor analysis, requires that these studies be carried out by a multicentre group. The advantages of international collaboration, when possible, should ensure more uniform methods and definitions as well as more rapid recruitment of subjects. Granting agencies may find such an approach more attractive, and the results may be more relevant.

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Acknowledgement of Scientific Reviewers

"The author and editor could not produce a journal of quality without the anonymous, unpaid and sometimes insufficiently praised reviewer" (Can Med Assoc J *1981; 124: 665). The editors of* CMAJ *thank the following, who reviewed manuscripts between Jan. 1 and June 30, 1989.*

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