Canadian panel ponders health issues

The following report on the Consensus Conference on Cholesterol held in Canada in March was prepared from notes by Kenneth K. Carroll of the Department of Biochemistry, University of Western Ontario, London, Ontario, Canada, and from the preliminary recommendations of the consensus panel. Carroll is Associate Editor for JAOCS *News for Lipid Biochemistry.*

Asked to ponder the implications of cholesterol and lipoproteins in atherosclerosis and coronary heart disease, a Canadian consensus panel has noted that "no single strategy will be adequate to cope" with the incidence of heart attacks and strokes in Canada. Instead, it said these problems demand "a collaborative approach, utilizing a public health approach as well as identification of individuals at risk."

The panel noted the need for a strong public educational program as part of a health promotion effort.

Two years ago, the Canadian Atherosclerosis Society saw the need to develop a Canadian point of view on the issue of cholesterol and lipoproteins in atherosclerosis and in coronary artery disease. As a result, a consensus panel was selected, and a consensus conference on cholesterol was held at the Government Conference Centre in Ottawa March 9–11, 1988.

The conference, which attracted more than 300 registrants, was sponsored by the Canadian Atherosclerosis Society, The Canadian Heart Foundation, Health and Welfare Canada, and the Heart and Stroke Foundation of Ontario. It was similar in format to an earlier U.S. consensus conference on lowering blood cholesterol to prevent heart disease.

The consensus panel included a lawyer, a family practitioner, biochemists, nutritionists, a pathologist and an epidemiologist. The chairman was an internist and cardiologist with a long-standing interest in the area of coronary heart disease. Members of the panel received copies of the British, European and American consensus documents in advance of the conference, along with a list of questions to address. Each panelist was asked to prepare a statement on the issues in his or her area of expertise. These reports were circulated among panel members before the conference.

The conference was organized by a committee headed by Alick Little of St. Michael's Hospital, Toronto, Ontario. Conference sessions were chaired by Louis Horlick of the University of Saskatchewan, Saskatoon, Saskatchewan, and Paul Lupien of l'Université Laval, Ste.-Foy, Quebec.

At the first session, the relation of serum lipid and lipoprotein risk factors to heart and vascular disease was discussed. Avrum Gottlieb of the University of Toronto, Toronto, described the pathology of atherosclerosis derived from studies on both experimental animals and humans. Jean Davignon of the Institut de Rescherches Cliniques de Montreal, Montreal, Quebec, discussed the genetic basis and lifestyle causes of hyperlipoproteinemia. William Castelli of the Framingham Heart Study, Framingham, Massachusetts, and Stephen MacMahon of Oxford University, Oxford, England, presented data derived from epidemiological studies of coronary heart disease. Maurice Mishkel of McMaster Medical Centre, Hamilton, Ontario, provided information on the serum lipid and lipoprotein distribution in a Canadian population measured as part of the Lipid Research Clinics Studies. Bernard Wolfe of University Hospital, London, Ontario, spoke on detecting and defining high-risk lipid profiles and how they relate to one another.

The second session dealt with strategies for managing the patient with coronary heart disease. Kenneth Carroll of the University of Western Ontario, London, Ontario, discussed effects of different dietary components on serum lipids and lipoproteins. Ruth McPherson of St. Michael's Hospital provided details of management of the patient with abnormal serum lipids. Larry Leiter of Toronto Western Hospital, Toronto, discussed results of the Coronary Primary Prevention Trial and Principles of Drug Management of Abnormal Serum Lipids. Alexander Logan of Mount Sinai Hospital, Toronto, summarized the conclusions of a task force on periodic health examinations, and Peter Kwiterovich of Johns Hopkins Hospital, Baltimore, Maryland, considered the special case of children with abnormal serum lipids and lipoproteins.

The third session was devoted to a discussion of public health approaches to the prevention of coronary heart disease and to ideas for future research. Gary Myers and Gerald Cooper of the Center for Environmental Health, Centers for Disease Control, Atlanta, Georgia, and Robert Patten of St. Michael's Hospital discussed the difficulties of accurate and precise measurement of serum lipids and lipoproteins and the need for standardization of these measurements. Bruce Holub of the University of Guelph, Guelph, Ontario, described North American dietary trends with particular emphasis on lipids and touched briefly on other measurements, such as blood fluidity and blood clotting, of significance to coronary heart disease. David Jenkins of St. Michael's Hospital discussed the optimal diet for the Canadian public.

In a continuation of this session, Henry Blackburn of the University of Minnesota, Minneapolis, Minnesota, discussed the scientific basis for the population strategy of coronary heart disease prevention. Jiri Frohlich of Shaughnessy Hospital, Vancouver, British Columbia, offered a viewpoint on optimal serum cholesterol, triglyceride and lipoprotein levels for the Canadian public. Andres Petrasovits of Health and Welfare Canada, Ottawa, summarized the epidemiology of ischemic vascular disease and its risk factors in Canada, noting some of the geographic differences and implications for a na-

tional strategy of prevention. Lewis Lloyd of Agriculture Canada, Ottawa, discussed the impact of dietary guidelines on agriculture, and Bern Schnyder of Canada Packers, Toronto, considered the implications for food processors. Peter Wood of Stanford University School of Medicine, Palo Alto, California, presented data illustrating the importance of exercise and energy balance in modifying risk of coronary heart disease. Finally, Aubie Angel of Toronto General Hospital, Toronto, discussed ideas for future research on serum lipids and lipoproteins in relation to heart and vascular disease.

While the panel met to prepare a consensus report, an informal education program was presented for other registrants. This was chaired by Daria Haust of the University of Western Ontario and Jean Davignon and began with papers outlining the development of research on atherosclerosis in Canada. Robert More of McGill University in Montreal, Daria Haust and Gardner MacMillan of the National Heart Lung Blood Institute of the National Institutes of Health of Bethesda, Maryland, described studies on experimental pathology. Kenneth Carroll discussed dietary approaches, and Maurice Mishkel presented information on studies with lipid-lowering drugs. Work on genetic aspects such as chylomicronemia and familial hypercholesterolemia were discussed by Philip Connelly of St. Michael's Hospital and the University of Toronto, Alick Little and Jean Davignon. David Maclean of the Nova Scotia Department of Medicine discussed health surveys in Canada with particular emphasis on the Atlantic region. Geoffrey Duncley and Rob Dolan of the Ottawa-Carleton Health Unit, Ottawa, described approaches to risk reduction in the community using examples from the Ottawa-Carleton Heartbeat Program.

The following recommendations were included in a preliminary report issued by the panel at the conclusion of the conference. It is expected that the final report will contain some modification of these recommendations based on further deliberations by the panel.

- In view of the extensive evidence that cardiovascular diseases are strongly related to lifestyle and environmental factors that are modifiable, government agencies at all levels and voluntary agencies should give high priority to developing health promotion programs. The panel recognizes the need for comprehensive dietary guidelines for Canadians.
- The agriculture and food industry should be encouraged to maintain and continue efforts to produce foods that will allow the Canadian population to achieve lower levels of blood cholesterol. Restaurants, fast food outlets, industrial and school cafeterias and other caterers should be encouraged to serve meals low in fat and cholesterol. Consumers need better and more explicit food information to aid in healthy food choices.
- Determination of lipid risk factors should be considered a priority for subjects known to have coronary heart disease: those with a family history of hyperlipidemia or coronary heart disease occurring at an early age, or those with hypertension, diabetes or renal failure. As resources permit, determination of these factors should become part of a periodic health exam for all adult Canadians. Preference should be given to those individuals with other risk factors.
- Lipid risk factors include elevated total cholesterol, elevated low density lipoprotein (LDL), low levels of high density lipoprotein (HDL) and a high total cholesterol/HDL ratio in blood serum, as these factors are strongly related to the development of atherosclerosis in humans and a high clinical relevance for the likelihood of developing coronary heart disease. Reduction in the level of these lipids and lipoproteins will decrease the risk of coronary heart disease. Other lipid risk factors showing promise as predictors of heart disease are the apolipoproteins. Additional research and improved methods are required before these can be recommended for routine use.
- A minimum of two consecutive tests one month apart should be done to determine cholesterol and LDL levels. Intervention to lower blood cholesterol levels is recommended for men and women age 30 or over with levels over 240 mg/dl. In the range of 200–240, intervention should be considered if the LDL cholesterol is greater than 130, the HDL level is below 35, or the triglyceride level is above 200. For those between the ages of 18–29, intervention is recommended when the level exceeds 220 mg/dl; in the range of 180 to 220, intervention should be considered if the LDL cholesterol level is greater than 115, the HDL cholesterol level is below 35, or the triglyceride level is above 200. The presence of other variables such as family history of early coronary heart disease, smoking, hypertension, diabetes or obesity may suggest a need to intervene at lower levels. Routine measurements for blood and lipoprotein cholesterol levels are not advised for children under age two. Levels should be determined for children older than two years when there is a family history of risk factors.
- Dietary modification should remain the principal intervention for individuals with elevated blood lipids. Total fat intake should not exceed 30% of total energy intake. Saturated fatty acids should be limited to 10% or less of energy intake; individuals also should restrict their intake of organ meats and egg yolks. Essential fatty acids should be included in the diet, but total polyunsaturates should not exceed 10% of energy intake. Protein intake should range from 10% to 15% of total calories. The remaining calories should be derived from carbohydrates, with emphasis on polysaccharides and food sources providing dietary fiber. Physical activity to achieve and maintain cardiovascular fitness is encouraged. Reasonable fat intake for children is 30% to 40% of total calories.
- Hypolipidemic drug therapy should be used only after an adequate trial of rigorous diet modification. Drug treatment should be undertaken with appropriate caution.
- Laboratory facilities should be expanded and upgraded to handle the volume of testing needed to implement these recommendations. Provincial and federal governments, in collaboration with ap-

propriate professional societies, should improve and standardize assays by establishing regional reference laboratories and effective proficiency testing programs. A national professional education campaign for physicians and other health care personnel should be implemented concerning the diagnosis and treatment of individuals at elevated risk. Provinces should take immediate action to provide more training positions for dietitians and further professional education for those already in the field.

The panel also identified research and development priorities in biomedical, clinical, nutritional, health services, public health, social and behavior areas relevant to cardiovascular disease. These included the following:

Biomedical—Greater support is needed for further basic research into the underlying mechanisms of atherosclerosis. Areas for special emphasis might include lipoprotein and apoprotein metabolism, lipoprotein receptors, cell biology of the atheromatous process, the role of genetics in coronary artery disease, and development of tests with greater predictive value for the risk of coronary disease than those generally available. This should include assessment of various test results in combination, and continued development of tests for apoproteins.

Clinical—Continued investigations on the natural history of coronary artery disease and of intervention strategies are needed. Other areas might include the interaction with other disease processes and obesity. The optimal frequency of testing has not been determined for any category of patient. Clinical follow-up studies are needed to reveal variations in lipid profiles over time as a basis for future recommendations on testing frequency.

Nutritional—Urgent priorities in the area of nutritional research include the role of essential fatty acids, fish and vegetable oils; the continued investigation of optimal nutrition for children; and the assessment of the nutritional status of Canadians.

Health services—Economic studies of the relative cost-effectiveness of alternative approaches to preventive and intervention measures would help refine policy and program development.

Public health—Continued development of cardiovascular surveillance activities is needed, including both survey and records linkage approaches to assessing population needs and planning and evaluating programs. Population surveys of food knowledge, attitudes, practices, health and nutritional status are urgently needed.

Social and behavioral—Risk factors for cardiovascular disease are known to cluster in lower socioeconomic groups, and are less amenable to modification in these circumstances than in Canadian society generally. Research is required to identify social and environmental barriers to change, and methods of assisting individuals and groups to overcome these barriers. The need for research training in social and behavioral science relating to cardiovascular health and disease deserves special recognition in Canada.

The consensus panel consisted of Louis Horlick of University Hospital, Saskatoon; Joyce Beare-Rogers of Health and Welfare Canada, Ottawa; George Beaton of the University of Toronto; Carl Breckenridge of Dalhousie University, Halifax, Nova Scotia; Judith Cutler, a family physician of Powell River, British Columbia; Patricia Giovannetti of Brescia College, University of Western Ontario; Paul Lupien of the Centre Hospitalier de l'Université Laval; Sean Moore of McGill University, Montreal; John Ruedy of St. Paul's Hospital, Vancouver; Matthew Spence of the Clinical Research Centre, Halifax; Frank White of Dalhousie University; and John Willson, a lawyer, of Perth, Ontario.