BMA gives thumbs down to regulatory body

The British Medical Association has voted "no confidence" in the General Medical Council, the government-appointed body that regulates medicine in the UK. The historic vote came during the BMA's recent annual meeting, during which doctors reaffirmed their support for self-regulation but voted by an 80% margin that they had no confidence in the GMC "as presently constituted and functioning." They demanded "urgent reforms of its structure and functions in consultation with the profession."

British politicians have recently been calling for an end to self-regulation after several high-profile disciplinary cases. One involved a GP, Harold Shipman, who was found guilty of multiple murders earlier this year. Another case, decided July 20, saw gynecologist Richard Neale found guilty in 34 of 35 charges involving more than a dozen patients. Most of the charges involved incompetence and neglect, but he was also found guilty of doctoring his resumé. The British-trained Neale has a Canadian connection — he was struck off the register in British Columbia and Ontario for incompetence before returning to the UK in 1985. (On July 26, the GMC decided to revoke his licence for 5 years.)

The BMA move came a few weeks after the GMC president, Sir Donald Irvine, said that recent problems had "shaken the foundations of medicine" and that it was time for the GMC to shift its emphasis from protecting doctors to protecting patients.

A BMA spokesperson told *CMAJ* that the GMC "is not adequately protecting doctors or patients. Doctors have taken a battering recently and the GMC hasn't been active [in responding]."

In particular, there is now a 2-year delay in hearing complaints against doctors, which the spokesperson said is unfair for both patients and doctors. "The GMC is not open about what it's doing — it says it is preparing some reforms but we have no idea what they are."

Irvine responded to the BMA vote by saying that the GMC has accelerated the "radical overhaul" of its structures and procedures. A GMC spokesperson said the council has had "many discussions with senior members of the BMA and we have consulted them all the way."

Last month, Parliament granted the GMC's request for new powers that will allow it to increase its membership so that there will be more people available to sit on disciplinary committees; 160 physicians are currently awaiting a hearing. The GMC has turned its members' dining room into an ad hoc second courtroom and will soon be able to hear 3 cases at a time. — *Caroline Richmond*, London, England

A smoke signal from Florida

The size of an award set by a Florida court in a suit against tobacco companies may be mind-boggling — at US$145 billion it is bigger than Canada's federal budget — but many lessons from the case can be applied here, an antismoking lawyer says.

David Sweanor, senior legal council with the Non-Smokers' Rights Association, says the Florida case hinged on the informed-consent issue and Canadian courts have already taken "very strong" stands on it. "Most physicians are familiar with informed consent and this case was about the fact that the companies did not give smokers all the information that was available. What they didn't want them to know, for example, was that 'light' cigarettes are a scam."

The Florida suit, on behalf of 700 000 sick smokers in the state, lasted 2 years, but the 6-member jury took only 5 hours to set the award. Although the smokers are unlikely to see little if any of the money because of the lengthy appeal process, Sweanor said the award is still a watershed event because of its size.

Although no trials are imminent, several class actions and individual proceedings are being pursued against tobacco companies in Canada. "Naturally, any awards here won't be anywhere near as large as that one," Sweanor said. — *Patrick Sullivan*, CMAJ

MD Management's rapid growth continues

The amount of money under administration at MD Management is expected to surpass the $15-billion mark by the end of August. The Investment Funds Institute of Canada says MD Management is now the country's 15th-largest mutual fund company. (It ranks 11th in size if all the funds it administers are included). MD Management Vice-President Ron Bannerman says the 31% growth in funds under administration since Dec. 31, 1998, places MD Management in the top quartile of growth among Canada's 70 mutual fund companies. The company, the largest of its type in the world, passed the $1-billion mark in assets under administration in 1985. This latest fund total means that the company has been growing by an average of almost $1 billion a year since then.

Saving face: doctors lobby to protect hockey players

For 18 years, Dr. Dennis Pitt has been trying hard to convince players in his own hockey league to wear masks that provide full facial protection. Realizing the difficulties he faced convincing individual players, Pitt changed his game plan. Since January he's been working with the 500-member Ottawa Academy of Medicine, the local branch society of the Ontario Medical Association, in an attempt to gather national support to encourage major hockey bodies like the NHL to make full facial protection mandatory. The issue gained national attention last March when Toronto Maple Leaf defenceman Bryan Berard, 23, was seriously hurt in one eye by an errant stick. The injury ended his career.

"We're very pleased with the response so far," says Pitt. The Canadian Ophthalmological Society and Canadian Dental Association will be supporting the campaign, and the issue was discussed at a meeting of NHL team physicians in July.

The Canadian Standards Association says more eye injuries are sustained in hockey than in any other sport. Between 1972 and 1997, 1860 such injuries were recorded, with 298 resulting in at least partial blindness.

A recent article in *JAMA* (1999; 282[24]:2328-32) concluded that the risk of a facial or dental injury was 9.9 times greater for players wearing half-face shields instead of full-face ones. "The chin piece of the full-face shield also helps hold the helmet in place during impact, thereby maintaining maximum player protection from brain injury."

Health organizations have influenced hockey safety in the past. Data released by the by the Canadian Ophthalmological Society in 1994 persuaded the Canadian Amateur Society Association to require Canada's young hockey players to wear full-facial protection. However, once players reach junior age (16 to 20 years) and more senior levels, such as the NHL, they do not have to wear the full protective gear.

If there isn't significant progress by the winter, Pitt says the academy will renew its lobbying efforts. "This is the only way things will change," he says. "The players won't do it."

Physicians interested in joining the lobbying effort can phone the Ottawa Academy of Medicine, 613 733-2604; dawna.feeley@on.aibn.com — *Barbara Sibbald*, CMAJ

Canapress

Toronto Maple Leaf player Bryan Berard, shown here after being injured, lost most sight in one eye when hit by a hockey stick last March.

CMPA deal reached

The Ontario government, Ontario Medical Association and Canadian Medical Protective Association hammered out a 3-year agreement in July that ensures Ontario doctors will remain under the CMPA umbrella. Many were concerned that the OMA would go its own way in providing malpractice coverage because of the CMPA's decision to introduce regional rating (see *CMAJ* 2000;163[2]:201). "We're all anxious to make this work," said a relieved Dr. John Gray, secretary-treasurer of the CMPA. Although CMPA fees will increase in Ontario, the 45% rise introduced by regional rating will now be spread over 3 years. The increase could conceivably be less than that because of savings brought about by the agreement, which calls on the government to consider introducing tort-reform legislation. Gray said that may prove to be one of the key benefits of regional rating: "I think the government now clearly understands that tort reform can provide substantial benefits." In 2000, CMPA fees in Ontario totalled $84 million, with the province paying about $60 million of that. — *Patrick Sullivan*, CMAJ

Blue Jays show a little skin

Toronto Blue Jay players, coaches and family members were screened for skin cancer in July as the Canadian Dermatology Association teamed with the American League baseball team in an attempt to increase awareness of the disease. The association says that a million new cases are diagnosed annually in North America, with melanoma alone claiming 7700 lives. The association says ball players are at particular risk for skin cancer because of the amount of time they spend in direct sunlight.

Newfoundland seeks solution to MD turnover

In Newfoundland and Labrador, the turnover of international medical graduates is so severe that for every IMG who arrives in the province, another leaves. Now, a new outreach program of the Newfoundland and Labrador Medical Association aims to keep foreign-trained physicians in the province.

Launched last fall, the IMG Preceptor Program matches incoming physicians with other physicians with similar backgrounds. A motivating factor, says NLMA Past President Ian Smith, is the simple desire to make new physicians feel more at home. "It turns out a lot of them are turned off in their first few weeks here by a wide variety of things, many of which are related to a lack of familiarity with the Canadian system," says Smith.

Bruce Squires, the NLMA's executive director, now meets every incoming IMG as they prepare to practise in the province. "I spend a little bit of time talking about the association and that program, [but] I usually spend a lot more time answering questions."

Typically, there is confusion about terms and conditions of working arrangements, such as on-call hours and working hours. "When we sit down there are usually a lot of questions, particularly when it comes to call. It's such an evolving issue."

The IMGs are then advised that they will be contacted by a preceptor once they start practising. So far, more than 30 physicians in 16 communities have volunteered as preceptors.

"Some [IMGs] never had any intention of practising here long term, but a significant number arrive with no fixed plans," Smith explained. "That's a group of physicians that we would very much like to attract to this province and keep for as long as we can."

Smith said first impressions are a potent factor. "We talked to several people who had already decided to leave and they had been here for less than 3 months."

Negative factors can include education opportunities and accommodation. "One of the things we were told was that if, for instance, you spend a hundred bucks and put some soap and towels in these places before someone shows up, it can make a huge difference. It gives you the impression that you're wanted, as opposed to just another body passing through."

Dr. Robert Young, registrar of the Newfoundland Medical Board, estimates that about 100 foreign-trained physicians arrive to practise in Newfoundland every year and the same number leave. —*John Gushue*, St. John's

McMaster University

Dr. Deborah Cook, shown here with St. Joseph's Hospital CEO Allan Greve, has been appointed to fill the country's first chair in critical care medicine. The Hamilton internist was appointed to the McMaster University/St. Joseph's Hospital Regional Academic Chair in Critical Care Medicine in June. Cook, who chairs the 60-member Canadian Critical Care Trials Group, marvels that it took so long to create this type of chair in Canada. The appointment will allow her to establish an academic program in critical care medicine, with a focus on clinical interventions and ethical issues.

Eat right, live longer?

Research into the effect of single nutrients such as vitamin E on disease rates and mortality has yielded disappointing results. However, we know that the biologic effects of nutrients are interdependent and thus the health effects may depend more on a balanced and healthy diet rather than on the effect of a single component. Ashima Kant and colleagues, taking advantage of a large prospective cohort study of women presenting for breast-cancer screening, were able to follow 42 000 women (mean age 61) over a median follow-up period of almost 6 years (*JAMA* 2000;283:2109-15). Women who reported that they regularly ate more fruits, vegetables, whole-grain foods, low-fat dairy products and lean meats and poultry had lower overall mortality. Compared with women in the lowest quartile for eating healthy foods, women in the upper quartile had a relative risk for all-cause mortality of 0.69 (95% confidence interval 0.61–0.78). The authors concluded that it may be beneficial to follow recommended nutritional guidelines.

On the Net

Any doctors hiding in the family tree?

If you've ever felt that medicine was "in the blood," the Internet offers a new way to find out. Alex Glendinning, a British financial planner with a passion for the past, has created a Web site dedicated to the art of genealogy. And he has a special place in his heart for physicians.

His page (**user.itl.net/~glen/doctors.html**) provides a road map for those interested in digging into medical family histories. He not only provides resources broken down by category but also lists people willing to help in your search.

If you suspect there was a British army or navy doctor somewhere in the family tree, Glendinning suggests clicking into the Society of Genealogists at the Public Record Office in London (**www.pro.gov.uk**). The office has full army and navy lists dating from the mid-1700s. If you've a wee bit 'o the Irish in your veins, visit the holdings of the Royal College of Surgeons in Ireland (**www.rcsi.ie/library/index.html**).

As with most genealogical research, listed sources are weighted heavily to the British Isles, but there are links and references to resources around the world.

In Canada, Glendinning suggests trying the National Archives of Canada (**www.archives.ca**), the British Columbia Vital Events Index (**www.bcarchives.gov.bc.ca/textual/governmt/vstats/v_events.htm**) or the immigration and passenger records database (**www.inGeneas.com/ingeneas/index.html**). The latter provides records for the 18th, 19th and early 20th centuries; documents can be ordered online for around $8.

For general information on all things genealogical, turn to Cyndi's List (**www.cyndislist.com**), a categorized and cross-referenced index of Internet genealogical resources created by genealogical writer Cyndi Howells. She includes a special section for medical professionals (**www.cyndislist.com/medical.htm#doctors**). The site is

very popular with the genealogy crowd — it has had more than 16 million visitors since it was launched in 1996. (All Web sites listed in this article were operational on July 20, 2000.) — *Michael OReilly*, mike@oreilly.net

MDs promote self-sufficiency in ravaged Africa

Against a backdrop of drought, internecine warfare and an AIDS pandemic, it's difficult to know where to start when attempting to reduce suffering in sub-Saharan Africa. Canadian Physicians for Aid and Relief thinks it has found one way: concentrate on establishing healthy, self-sufficient communities, not on providing medical care. "Our goal is building healthy communities, and access to clean water, proper nutrition and primary health education are some of our strategies," says Dr. David Zakus, CPAR's president.

CPAR

Much of CPAR's work involves improving water supplies. This unprotected spring in Ethiopia is at risk of becoming polluted.

The organization's efforts are concentrated in Ethiopia, Uganda and Malawi, where it tries to provide the resources needed to build wells, protect springs and prevent drought. To combat deforestation and erosion, CPAR is coordinating and funding a reforestation program that has seen 46 million trees planted by local residents since 1986; CPAR pays planters for their work. In some areas, where drought has forced people to eat their own livestock and planting seed and to sell their agricultural tools to buy food, CPAR is now attempting to supply tools and seed.

The organization was launched as one doctor's response to the Ethiopian famine of 1984. Toronto physician Mark Doidge and his friend Henry Gold, an engineer, created CPAR as a way to provide food and emergency health services during that crisis.

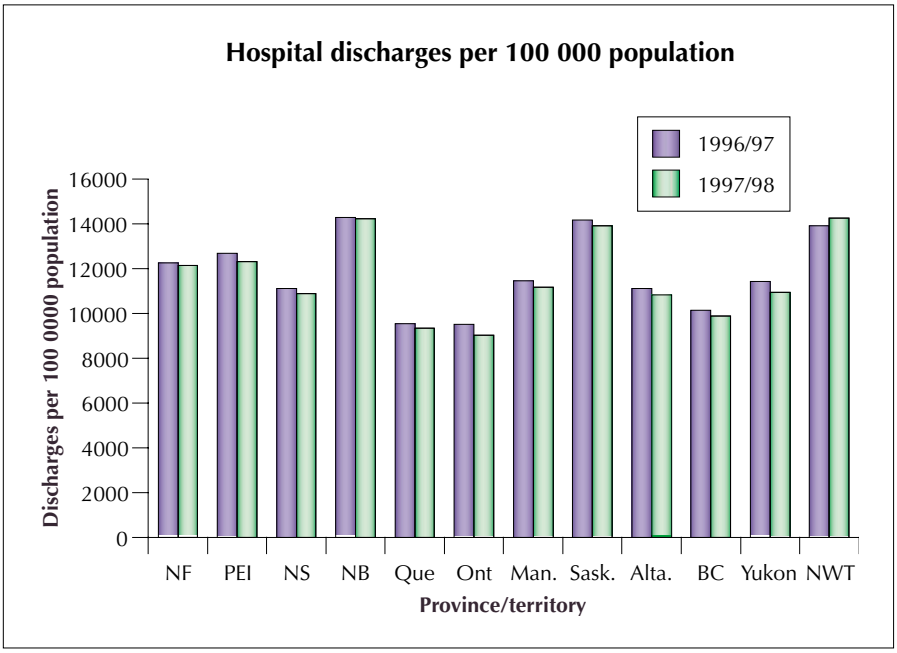
CPAR, which has offices in Africa and Toronto, can be reached at 416 369-0865 or **cpar@web.net**; the Web site is at **www.cpar.ca**. — *Susan Pinker*, Montreal

Pulse

Lengthy hospital stays a thing of the past?

Data from the Canadian Institute for Health Information (CIHI) indicate that the average length of a hospital stay in Canada dropped by more than 5% between 1994/95 and 1997/98, falling from 7.4 days to 7.0 days.

The age-standardized discharge rate (a measure of Canadians' in-patient use of hospitals) fell by 13.8%, from 11 499 discharges per 100 000 population in 1994/95 to 9913 per 100 000 population in 1997/98. When combined, these 2 figures point to a 15% decrease in total patient days between 1994/95 and 1997/98.



All jurisdictions except the Northwest Territories experienced a decrease in discharge rates between 1996/97 and 1997/98, with Ontario showing the greatest decrease (5.3%). In 1997/98, the highest discharge rates per 100 000 population were found in New Brunswick (14 304), Saskatchewan (14 171) and the NWT (13 937), while Ontario's rate was the lowest — 9530 per 100 000 population.

Women accounted for slightly more than half (51.1%) of nonpregnancy and childbirth-related hospitalizations in 1997/98. Heart disease and stroke were the leading cause of hospitalization for both males (20.5%) and females (15.1%), followed by digestive diseases (13.1% of hospitalized women, 12.6% of men).

In 1997/98, patients 65 and older accounted for 34.7% of all hospitalizations, and stayed in hospital an average of 10.5 days. In contrast, adults between the ages of 20 and 64 stayed an average of 5.4 days. Hospital stays for children and teenagers lasted an average of 4 days. — *Shelley Martin*, martins@cma.ca

New federal priorities for health care spending coming next month?

Federal Health Minister Allan Rock and several of his provincial counterparts met with physicians, nurses and other health care professionals recently to reassure them that a "plan of action" on health care funding is in the works. The meeting was held in mid-July as the country's health ministers met in Ottawa. "I was reassured today that the ministers are hearing our message," CMA President Hugh Scully said after the meeting. "I heard a commitment to move past the blame game to address the problems together."

The "blame game" refers to provincial demands that Ottawa restore the $4.2-billion cut from annual transfer payments in the name of eliminating the deficit. The federal government has responded that more money will flow into health care, but only for specific programs. "We recognize that provinces control the spending on health in their own jurisdictions and therefore set their priorities," added Scully. "The point we stressed to the ministers was that cooperation is needed to put true national standards in place so the level of care is the same in PEI as it is in BC."

Ginette Lemire-Rodger, president of the Canadian Nurses Association, agreed that the current problems extend beyond money. "We need a long-term funding base that is stable, but also a vision of the future for the health care system," she said. "It's not enough to put money into the system. It must be reformed as well."

Observers at the health ministers' gathering believe Rock set the stage for a much more congenial meeting by backing away from his plan to devise a national home-care program. That proposal was controversial because the provinces say it involves federal encroachment on their turf. The ministers appeared to make headway during the meeting, but a formal agreement on priorities for new health spending is not expected until next month, when Prime Minister Jean Chrétien meets with the provincial premiers. — *Steven Wharry*, CMAJ

Clinical Update

Hypertension and α-adrenergic blockers: preliminary ALLHAT results

The ALLHAT officers and coordinators for the ALLHAT Collaborative Research Group. Major cardiovascular events in hypertensive patients randomized to doxazosin vs chlorthalidone: the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT). *JAMA* 2000;283:1967-75.

Background

Hypertension increases the risk of morbidity and mortality from cardiovascular disease.[1] Canadian guidelines recommend the use of diuretics, β-adrenergic blockers or angiotensin-converting-enzyme (ACE) inhibitors as first-line therapies.[2] The role of other antihypertensive drugs as first-line therapy is less clear.

Question

Does the treatment of hypertension with an α-adrenergic blocker (doxazosin) reduce the risk of cardiovascular events as effectively as a thiazide diuretic (chlorthalidone)?

Design

The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) is a randomized, double-blind trial involving 625 centres in the United States and Canada.[1] Between 1994 and 1998, 42 448 hypertensive patients were randomly assigned to receive 1 of 4 antihypertensive drugs as first-line therapy: a calcium antagonist, an ACE inhibitor, an α-adrenergic blocker and a thiazide diuretic. The α-adrenergic blocker arm was discontinued early following interim data analysis. Results from the 24 335 patients randomly assigned to receive either the α-adrenergic blocker (doxazosin, 2–8 mg/d) or the thiazide diuretic (chlorthalidone, 12.5–25 mg/d) were published in this initial report.[1]

All subjects were 55 years of age or older with hypertension and had at least one cardiac risk factor, such as previous myocardial infarction (MI) or stroke, left ventricular hypertrophy, type 2 diabetes mellitus, low level of high-density-lipoprotein cholesterol and current cigarette smoking. The treatment goal was a blood pressure of 140/90 mm Hg or less. If the treatment goal was not achieved despite maximum doses of the study drug, antihypertensive therapy was intensified according to a predetermined protocol involving additional drugs (atenolol, reserpine, clonidine or hydralazine). The primary end point was the composite of fatal coronary artery disease (CAD) and nonfatal MI. Secondary end points included all-cause mortality, CAD-related death, nonfatal MI, revascularization procedures, angina, congestive heart failure, stroke and peripheral vascular disease.

Results

The subjects' mean age was 67 years; similar numbers of men and women participated. Diabetes was an additional risk factor in 36% of subjects, and 22% were current cigarette smokers. The mean blood pressure was 145/83 mm Hg at the time of enrolment, with 90% of subjects already receiving an antihypertensive drug. The median length of follow-up was 3.3 years.

At 4 years' follow-up the mean blood pressure was 137/76 mm Hg among the patients receiving the α-adrenergic blocker, with 58% of these subjects reaching the treatment goal of a blood pressure below 140/90 mm Hg; the mean blood pressure of subjects receiving the diuretic was 135/76 mm Hg, with 64% reaching the treatment goal. No significant difference was observed between the 2 groups for the primary outcome (fatal CAD and nonfatal MI), for all-cause mortality, or for peripheral vascular disease. However, the group receiving the α-adrenergic blocker had a significantly higher relative risk (RR) for coronary revascularization (RR 1.15; 95% confidence interval [CI] 1.00–1.32; $p = 0.05$), stroke (RR 1.19; 95% CI 1.01–1.40; $p = 0.04$), angina (RR 1.16; 95% CI 1.05–1.27; $p < 0.001$) and congestive heart failure (RR 2.04; 95% CI 1.79–2.32; $p < 0.001$).

Commentary

ALLHAT is the largest trial yet comparing the effectiveness of several classes of antihypertensive drug with a thiazide diuretic as first-line therapy. These preliminary results show increased relative risk for a number of cardiovascular end points, including a doubling of the risk of congestive heart failure, in patients treated with an α-adrenergic blocker. That one-third of the subjects in both groups failed to reach the target blood pressure of less than 140/90 mm Hg is disappointing.

Practice implications

α-Adrenergic blockers should not be used in the first-line treatment of hypertension. The relative effectiveness of calcium antagonists and ACE inhibitors in comparison with thiazide diuretics will not be determined until the conclusion of ALLHAT in 2002. In the meantime, better attainment of blood pressure goals can reduce cardiovascular morbidity further. — *Benjamin H. Chen*

The Clinical Update section is edited by Dr. Donald Farquhar, head of the Division of Internal Medicine, Queen's University, Kingston, Ont. The updates are written by members of the division.

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Clinical Update

E. coli, antibiotics and hemolytic-uremic syndrome in children

Wong CS, Jelacic S, Habeeb RL, Watkins SL, Tarr PI. The risk of hemolytic-uremic syndrome after antibiotic treatment of *Escherichia coli* O157:H7 infections. *N Engl J Med* 2000;342:1930-6.

Background

In up to 15% of North American children infected with *Escherichia coli* O157:H7, hemolytic-uremic syndrome (HUS) develops because of systemic absorption of Shiga toxins produced by the organism.[1] Although antibiotics have been shown in vitro to enhance release of these toxins from injured bacteria,[2] their effect on the development of HUS in people infected with *E. coli* O157:H7 is unknown.

Question

In children with stool cultures positive for *E. coli* O157:H7, is antibiotic therapy associated with an increased risk of HUS, independent of the severity of the initial diarrheal illness?

Design

The authors of this prospective observational study[1] assembled a cohort of 71 children in whom stool cultures obtained within 7 days of the onset of acute diarrheal illness were positive for *E. coli* O157:H7. Subjects were less than 10 years old and were identified through a cooperative network of 47 laboratories in the United States. Demographic data and clinical features of the illness (vomiting, bloody diarrhea and fever) were obtained through a questionnaire completed by each child's caregiver. Details concerning antibiotic therapy were validated by the treating physician or through examination of medical records.

Complete blood counts and blood urea nitrogen and serum creatinine levels were measured daily for 14 days from the onset of their symptoms, or until the development of HUS (defined as a hematocrit of less than 30% with evidence on peripheral blood smear of red blood cell destruction, a platelet count of less than 150×10^9/L and a serum creatinine level exceeding the upper limit of normal).

Multivariate logistic regression was used to determine the relative risk of HUS associated with the administration of antibiotic therapy, adjusted for markers of disease severity.

Results

The study's criteria for HUS were met in 10 (14%) of the 71 subjects. HUS developed in 5 (56%) of 9 children who received antibiotic therapy and in 5 (8%) of 62 children who did not ($p < 0.001$). Children who received antibiotic therapy were comparable to those who did not with respect to age, sex and the baseline clinical and laboratory features of their illness.

Multivariate analysis showed that the risk of HUS was associated significantly with what were considered to be 2 surrogate markers of disease severity: initial peripheral white blood cell count ($p = 0.02$) and time elapsed from the day of symptom onset to the day on which stool cultures were obtained ($p = 0.008$). Risk was directly proportional to the white blood cell count and inversely proportional to the interval between onset of illness and stool cultures. It was inferred from the latter finding that patients with more severe illness were evaluated earlier than those with less severe illness. The relative risk of HUS among the children who were given antibiotic therapy, when adjusted for these 2 variables, was 17.3 (95% confidence interval 2.2–137, $p = 0.007$).

Commentary

Although this study is subject to the selection and confounding biases inherent in observational research, it offers compelling evidence of a link between antibiotic therapy and the development of HUS in diarrheal illness caused by *E. coli* O157:H7. The strength of the association and the biologically plausible effect of antibiotics on the amount of Shiga toxin available for absorption from the intestine support the inference of causality.

Implications for practice

Although HUS develops in patients infected with *E. coli* O157:H7 with or without antibiotic treatment, it occurs much more frequently when antibiotics are given. The findings of this study strongly suggest that these drugs should be withheld in children with acute diarrheal illness until stool cultures confirm growth of an organism for which antibiotic therapy is indicated (e.g., *Campylobacter pylori*). — *Donald Farquhar*

The Clinical Update section is edited by Dr. Donald Farquhar, head of the Division of Internal Medicine, Queen's University, Kingston, Ont. The updates are written by members of the division.

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Public Health

Ultra-endurance exercise and hyponatremia

Epidemiology

Ultradistance athletic events such as marathon races and triathlons put participants at risk of exercise-induced hyponatremia (plasma sodium level < 130 [normally 135–146] mmol/L). As the popularity of these sports increases, so does the number of reports of exercise-associated hyponatremia.[1] The spectrum of symptoms attached to this condition may range from asymptomatic to mild symptoms of confusion and loss of coordination to life-threatening seizures, pulmonary edema and coma with increased intracranial pressure.

Some of the earliest recognized cases of exercise-induced hyponatremia occurred in 1981 in 2 runners participating in a 90-km race in South Africa.[2] Subsequent case reports involving participants in ultradistance athletics, including a series of 5 cases of hyponatremia reported during the 1985 Canadian Ironman Triathlon, contributed to the general perception that exercise-induced hyponatremia is a rare event associated with extraordinary physical effort. More recently, though, cases have been reported during shorter distance events, such as marathons, and this suggests that hyponatremia may be occurring more frequently than realized. According to one review article, the problem was identified in 9% of athletes who sought medical care after the 1996 New Zealand Ironman and in 29% of race finishers in the Hawaiian Ironman triathlon.[2]

The cause of the condition remains unclear. One proposal is that hyponatremia is caused by large, unreplaced salt losses in sweat-associated dehydration; others have noted the relation between low post-race plasma sodium concentrations and weight gain and have proposed that fluid overload is the cause. In 1998 Speedy and colleagues[3] measured the association between pre-race and post-race weight change and post-race plasma sodium concentrations in 605 athletes entered in the New Zealand Ironman triathlon. Of the 330 athletes who finished the race, 58 had a plasma sodium level of less than 135 mmol/L, but only 18 (31%) of them sought medical help. Of the 58 athletes 11 had hyponatremia: it was symptomatic in 7, and 8 had either maintained or gained weight over the race. The authors concluded that hyponatremia was a common biochemical finding in ultradistance athletes but was usually asymptomatic, and that fluid overload was the cause of most cases of severe, symptomatic hyponatremia in the athletes. It has been postulated that renal mechanisms fail to cope with this fluid because of either a decreased glomerular filtration rate during exercise or an inappropriately high arginine vasopressin level.

Clinical management

Hyponatremia can be associated with low, normal or high tonicity. Hypotonic (dilutional) hyponatremia represents an excess of water in relation to existing sodium stores. The manifestations of hypotonic hyponatremia are largely related to dysfunction of the central nervous system, and they are more conspicuous when the decrease in the plasma sodium concentration is large or rapid (occurring within a few hours). Headache, nausea, vomiting, muscle cramps, lethargy, disorientation and depressed reflexes can be observed. Complications of severe and rapidly evolving hyponatremia include seizures, coma, brain damage, respiratory arrest, brain-stem herniation and death.[4]

Severe cases of dilutional hyponatremia may be corrected by exogenous sodium, by letting the body diurese the excess free water while redistributing available sodium, or a combination of both.[5] The risks of overly rapid correction of hyponatremia and the development of pontine myelinolysis are well recognized. A recent review article on hyponatremia recommends a targeted rate of correction that does not exceed 8 mmol/L on any day of treatment. The authors provide a helpful formula and table for determining the rate of infusion for selected infusates.[4]

Prevention

Ultra-endurance athletes should be made aware of the risks of overdrinking and hyponatremia as well as of the risks of dehydration. Restricting fluid intake to an appropriate volume, including some sodium-containing fluids, is advisable. Some authors recommend that weighing athletes before a race be a compulsory requirement of registration for these events and that post-race weights be included in the triage assessment of athletes presenting for medical care. They also recommend that an observation zone be added to the medical tent, that strict criteria for intravenous fluid administration be implemented and that support stations be placed at longer intervals throughout the event.[6]
— *Erica Weir*, CMAJ

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