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Safety and risk in practice

Hypophosphataemia: missing the diagnosis

The likelihood of missing the diagnosis of a potentially serious condition is one of the constant risks of medical practice. Physicians are very aware of it in such matters as early malignancies, but in some fields – such as the endocrine and metabolic diseases – it is perhaps too readily assumed that early symptoms will provide a sufficient signal to alert the doctor in good time to what is going on.

Haukeland and his colleagues [1] very recently described a man of 53 with a long history of alcoholism who was admitted to hospital because of epigastric pain, nausea, weakness and somnolence; there was a suggestion of haematemesis. He was in poor general condition with marked muscular atrophy. The serum potassium on admission was somewhat low, as was the serum magnesium, and he was given parenteral supplements of both, together with intravenous glucose. In hospital he was not eating, and after some days he developed paresis of the bladder and urinary retention. On the seventh day a repeated serum analysis showed his serum phosphate – which had not been measured on admission, to be a mere 0.12 mmol/l as compared with a normal range of 0.75–1.55. Haemoglobin and albumen had also fallen by a third since admission, which could have suggested further gastric bleeding. The patient reacted so dramatically to i.v. phosphate with further quantities of potassium and magnesium that he could be discharged a few days later in good condition. What had happened?

The authors' belief is that, as a chronic alcoholic, the man had become seriously undernourished and his phosphate reserves had fallen. On admission to hospital two things changed; firstly, he suddenly lost his access to alcohol and secondly he received parenteral glucose. Both these events can increase the cellular uptake of phosphate and cause the serum phosphate to fall to extremely low. The drop in haemoglobin and albumin during his first week in hospital reflected a dilution effect because of his rehydration.

Hypophosphataemia can result from serious malnutrition, as in elderly people living alone and in chronic alcoholics, but a problem with the diagnosis is that – because a rapid shift can occur in phosphate levels between the cells and the serum – measurement of serum phosphate may give a completely misleading impression of total body reserves [2]. It is possible that the principal symptoms appear when the cell reserves of phosphate fall. The consequences of hypophosphataemia for the central nervous system, the musculature and the heart, are sufficiently serious to demand early diagnosis, especially in patients who are already ill with other conditions. That the condition is sometimes overlooked can be a consequence of relying only on serum phosphate levels – or failure to look at phosphate at all when patients are admitted to hospital in poor condition without any obvious explanation for the cause.

References

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The approaching end of the mercury manometer

From the year 2003 onwards – and in some cases before that – a number of European countries will – for purely environmental reasons – prohibit the trade in mercury. No-one is likely to protest from the point of view of public health, but a less obvious consequence is that the trade in mercury sphygmomanometers will progressively vanish, and the automatic blood pressure recorder will take over. In some respects, that will be represent an improvement in medical practice, and it will at least end a controversy.

The use of the mercury manometer and cuff to measure blood pressure relies, of course, on the various tones which can be heard progressively through the stethoscope as the cuff is deflated, tones which owe their name to Nicolai Sergeyevitch Korotkoff of Russia (1874–1920) [1]. His first tone (K-1) is used to determine the systolic pressure. K2 and K3 are slight murmurs of no significance. However K4 is the point at which the heart tone becomes muffled, and K5 the point at which the last sound disappears. There has been a long debate as to the significance of these two latter points. In non-pregnant patients it now seems to be generally agreed that K5 is the best indicator of diastolic pressure, but since 1969 a controversy has raged as to the correct end-point for diastolic measurement in pregnant women. In that year, MacGilivray and his colleagues reported that in a certain proportion of pregnant women a faint heart tone remained audible however far the cuff was deflated; i.e., in these women K5 could not be measured [2]. Although MacGilivray's work was not clearly confirmed on a larger series of pregnant patients – and despite the fact that others found the phenomenon which he had described to be very rare – the World Health Organization and other authoritative bodies issued a recommendation to the effect that in pregnant women K4 rather than K5 should be the end-point for diastolic measurement [3]. The question is how dependable – and how audible – the subtle tonal change known as K4 is for most physicians.

The matter has now been studied properly by a series of investigators in different countries. A Dutch group from the University of Utrecht suggested by 1996 that Korotkoff's fourth tone might be little more than a myth [4]. Using the same method, Shennan and his colleagues in Britain found it, to say the least, highly undependable [5]. The latest paper from the Utrecht group shows that whereas different observers examining the same pregnant patients were in almost entire agreement as to K1 and K5, K4 presented a problem. In a series of 231 pregnant women in each of whom two physicians attempted to measure K4, it was detected by both observers in only 55 cases, by one but not the other in 70 patients, and not detected at all in 106 women [6].

Bearing in mind that in the diagnosis of toxaemia of pregnancy the measurement of diastolic blood pressure is only one of the methods available, it is unlikely that patient care has ever been seriously endangered by incorrect measurements based on the Korotkoff's fourth tone. What should cause concern is that, in setting diagnostic standards, bodies like WHO and a series of national and international professional organizations should have rushed headlong into recommendations based on insufficiently tested data.

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Birth trauma – late behavioural effects?

The immediate, evident and sometimes permanent physical damage with can result from birth trauma is well documented. It is however possible that birth trauma could result is profound mental and behavioural effects in much later life, and that the risk has simply not been recognised? One investigator who has propounded that there are some hitherto unidentified links is Bertil Jacobson [1].

In a recent study, Jacobson looked at a large volume of epidemiological data from the US and using multiple regression analysis he looked for correlates of suicide rates with 12 factors including socio-economic conditions, broken homes, parental alcoholism and the quality of care provided during infancy. Several factors turned out to be significant, but the strongest positive correlation to suicide rates was with birth trauma. People who had suffered birth trauma were, according to this analysis, significantly more likely to kill themselves in later life.

Of itself, this could be a credible finding. Jacobson however went on to determine whether the method of suicide correlated with the kind of birth trauma. People who suffered asphyxia during birth tended, in his analysis, to kill themselves by asphyxia (hanging, stangulation, drowning or gas poisoning), whereas people who suffered mechanical trauma (such as during breech presentations or forceps delivery) tended to kill themselves mechanically (for example, shooting themselves or jumping from heights).

The author suggests that one is dealing here with some kind of imprinting similar to the kinds of imprinting phenomena that have been observed in animals. Taking things a step further, he looked at whether the presence of medications in the birthing process impaired the supposed imprinting (as it does in animals), and found that it did, i.e., the above correlations were not as strong when the mother received opiates or barbiturates during labour. On the other hand, the presence of such medications did seem to have an imprinting effect for the baby to grow up to be a drug addict (another credible finding). Of mothers of the addits, more than twice as many had been administered opiates as compared to controls ($P = 0.0002$). Barbiturates has been given about three times as often ($P = 0.0002$).

As some critical US psychiatrists and psychologists have already said in Internet discussions of Jacobson's paper, the puzzling thing about the work is its mixture of believable findings with more speculative and questionable results. The size of the groups studied is unfortunately not indicated, and the original data are not provided in sufficient detail to make recalculation possible. Nor is it clear how he dealt with the fact that, in later life, exact data on the conduct of a person's birth are often difficult to locate. In addition: there could be confounding factors, and even if one take the conclusions at their face value they still did not prove a causal relationship; one might after all expect a higher proportion of birth trauma in a population group which is generally not well treated in society, either medically or socially, and it is precisely in that group that one might expect higher suicide rates. As to the correlation of the various forms of birth trauma with the method of suicide, one is intrigued but not convinced. A lot more work is surely needed, at least on the imprinting issue.

Reference

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Needstick accidents with contaminated blood

The acute phase of hepatitis C commonly goes undiagnosed, since it usually runs a subclinical course; unhappily some 70–90% of cases subsequently become chronic and many of these end with cirrhosis. All reason, then, for the physician to be alert to situations in which the hepatitis C virus may have gained entry to the system. The essential problem is the needlestick accident when handling HCV positive blood, since according to the most recent and reliable findings this will lead to infection in some 3.3% to 10.3% of cases [1,2]. These figures are higher than those for HIV (probably 2–3%) but lower than those reported for hepatitis B infection (up to 30%); on the other hand acute hepatitis B infection is far less likely to become chronic. The first evidence of subclinical HCV infection will be an increase in serum alanine-aminotransferase (ALAT) and a positive HCV-RNA; such sings are likely to be positive within four months of the accident.

Other than the avoidance of such accidents there are no entirely efficaceous preventive measures as regards HCV infection. However, it now seems clear that treatment with the antiviral drug interferon alpha during the period of an acute infection significantly reduces the risk of the infection subsequently becoming chronic. THe practical consequence of this is that, if an individual (professional or patient) has been exposed to HCV infected blood because of a needlestick accident, interferon alpha treatment should be offered.

Various treatment schemes have been recommended. Vogel et al. [3], dealing with patients in whom both diagnostic tests were HCV-positive and in whom serum transaminases has attained values of 593–1940 U/litre, administered interferon-alpha in a daily dose of 10 ME until the transaminases had been normalised; HCV-RNA levels tend to become negative much earlier. This dosage scheme was generally well tolerated and it was found necessary to maintain it for 18–43 days. After six months 91% of patients were still HCV-RNA negative, and at 18 months the proportion was still 82% – a considerable improvement on the situation in untreated patients.

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Pavlov to the rescue

Efforts to relieve distressing conditions without the use of drugs continue, and some surprising ones are crowned with success; the only problem is whether they have very much chance of acceptance so long as the pharmacological approach is so heavily promoted.

The latest step ahead seems to be in the relief of vomiting and nausea, for example in pregnancy or during chemotherapy – both of these being situations in which there is every reason to avoid giving drugs if they can be avoided. Biederman and Davey from Scarborough, Ontario, used Pavlovian conditioning for the purpose, testing it both in animals and in humans. In a controlled study, the animals (ferrets) were conditioned against vomiting by repeated courses of treatment with a non-emetogenic drug, and

subsequently proved much less prone to vomit when treated with the emetogenic drugs lithium or cis-platinum. The small human trial followed the same pattern, with courses of caffeine in high doses as a non-emetogenic conditioning cue, followed by virtual rotation to induce vertigo. The caffeine markedly reduced the incidence of motion sickness, as compared with a that seen in a control situation where caffeine was administered in a low (non-conditioning) dose.

One can have some doubts about the evidence to date; various forms of conditioning will need to be tested (for example, to exclude the possibility that caffeine itself in sufficient doses has an antiemetic effect) and more vigorous emetic stimuli will need to be tested, but the first signs are that this method bears promise.

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And now for the bad news. . .

Writing in the April issue of "The Health Summary", Dr Paul Lambden provides an unusually thoughtful piece of writing on the perennial problem of communicating bad news to the patient. Here he is, literally:
"A patient for whom a diagnosis of serious or terminal illness has been made provides a difficult management problem for any doctor charged with the responsibility of communicating the information. There is no agreement within the profession about whether it is better to announce it in a matter-of-fact way, whether to provide information bit by bit, or whether to adopt a paternalistic "doctor-knows-best" attitude and withhold the information which is felt to be harmful or too upsetting to the patient. Of course the answer is that each patient is an individual, a human being whose response is as personal and unique as his or her finger-print. For some it is as painful not to know they are dying as it is for others to know. Many people require the information to allow themselves time to put their affairs in order and to say goodbye to friends and family. Yet my father, typical of many patients, did not want to know that his last illness was cancer and he took great trouble never to place himself in a position where he might formally learn the truth. Of course, he probably knew all too well what was happening but for him the comfort was in not discussing it, possibly not even having to think about it.

The upshot of all this is that doctors are required to make a judgement, aware at all times that they may make an entirely wrong decision. One of my most profound experiences as a medical student was to listen to a consultant telling a group of us on a ward-round that a nun, then an in-patient who had been diagnosed as suffering from terminal breast cancer, would be supported by her faith when informed of the diagnosis. He therefore told her, without very much compassion, that she would soon die. She was devastated. She was reduced to a tragic depressive, broken in mind and spirit by what turned out to be an appalling decision. She eked out her remaining weeks on a cocktail of antidepressants, isolated and bitter. The consultant had made the best decision he could in the light of the circumstances but could not have been more wrong. . . .

There is no solution to the problem. Judgements will continue to be wrong from time to time. I favour the "opening door" method. Though not applicable to everyone, it does work for many patients. It involves offering, during a conversation, a piece of information phrased to provide the option of a further question being generated. In that way each statement give the patient the opportunity to discover more about his or her condition or elect to postpone or stop the discussion at a point of his or her choosing. Some prefer to discover everything at once, some take several consultations before receiving, if indeed they ever receive, the full details. This does have the merit of not treating patients as children, and perhaps avoids gross errors of judgement. Vitally, it also enables patients to ask direct questions which should, under all circumstances, be met with direct answers."

Reference

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Publicising medical error

In the very first issue of this *Journal*, Tony Smith contributed a paper on the theme: "Doctors should admit their mistakes". Towards the patients involved, yes. The question arising nowadays is however to what extent a doctor should continue to carry the burden of past error throughout his professional career. The issue has come very strongly to the fore in the discussion around some recent American state statutes which make the "practice profile" of physicians available to the public. These profiles include information on the individual doctor's education, diplomas and awards which he had received, his past career and his affiliations. However, they also provide data on any successful malpractice suits brought against the physician, any criminal convictions in his history, and any disciplinary actions brought against him. Practice profiles are readily available, for example as regards the State of Massachusetts on the internet (www.docboard.org/ma/df/masearch.htm). At least half a dozen States have enacted similar requirements, and Canada is currently considering whether it should follow suit.

The principle that, in an era of open information, a patient should have access to information on his or her doctor's past performance is a fair one. During the legislative process, Massachusets sensibly dropped clauses requiring that even unsuccessful malpractice cases should appear on the record, and the history of disciplinary actions was limited to the last ten years. Both steps represent attempts to avoid burdening the doctor throughout his career with an old history of unjust accusations or errors which he made in youthful inexperience or folly. But should even successful malpractice cases feature in a record like this? Perhaps the answer depends on the medical culture in the individual country. There are plenty of places in the world where a successful malpractice action usually represents a justified stain on the physician's reputation which he will have to live down by adhering to proper practice standards over a period of years. The position in the USA is regrettably still rather different: in the absence of any universal compensation scheme for medical misfortune (such as was pioneered in Sweden), a malpractice claim is all too often admitted as comprising the only means of recompense for an injured patient, even if this means artificially construing fault on the doctor's part. One can argue that some patients will understand this when examining their physician's record, but others will not, and it is in any case impossible in retrospect to determine whether the doctor was indeed negligent, incompetent or otherwise so seriously at fault that one would not wish to entrust oneself to his care. If Canada does choose to go along with the American trend, it should take serious account of these problems.

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Regulating complementary remedies

Slowly one is edging towards a reasonable solution of the problems in regulating complementary medicines. In South Africa the new SAMMDRA Act establishing a "Medicines and Medical Devices Regulatory Authority" was promulgated on April 30th. The new body will include separate evaluation systems for orthodox medicines and for complementary remedies; for the latter, safety and quality will have to be demonstrated, but the need to prove therapeutic claims will be replaced by a labelling provision making it clear that the remedy in question is derived from a particular alternative or traditional school of treatment.

Canada has created an Office of Natural Health Products to remove these products from the legislative void in which they have until now languished, and it is due to begin operations later in 1999. There is controversy as to how the new Office will set about its task, but broadly it seems likely to follow the South African line, concentrating on safety, quality and labelling alone – if only because (as one commentator has put it) ". . . There's not enough money in the federal budget of Canada or the US to come up with valid efficacy data for all natural health products currently in use".

Both countries' experiences during the next two years will be watched with interest.

Reference

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