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Vitamin and mineral supplements for preventing infections in older people

May have a place for some, but improved diet and physical activity will do more good

Primary care p 324

The number of older people is growing rapidly worldwide. In England alone the number of people older than 65 has more than doubled since the 1930s, and one fifth of the population is now aged 60 or more.[1] Ageing, disease, lifestyle, and environmental factors may all impair in older people the acquisition of food and its intake, processing, and metabolism, all leading to poor nutritional status.[2] Ageing is also associated with decreases in physical activity and lean body mass and an increase in body fat. The accompanying reductions in energy requirements and intake of food lead to lower intakes of macronutrients and micronutrients.[2]

Many older people exhibit poor immune responses and are at a high risk of infection.[3] Although the mechanisms leading to the age related decline in innate and adaptive immunity are poorly understood, several studies have shown a beneficial effect on the immune system of supplementing vitamins A, C, and E, and zinc and selenium, singly and as multinutrient supplements.[3]

Yet most prospective trials have found no beneficial effects of multivitamin supplements on infection among healthy older people,[4 5] and a recent meta-analysis of randomised controlled trials found the evidence for multivitamins and mineral supplements on risk of infections in older people to be weak and conflicting.[6] Nevertheless, Girodon et al reported that supplementation with trace elements and vitamins reduced infections in institutionalised older people.[7] Last year Meydani et al reported a protective effect of vitamin E supplementation over one year against infections of the upper respiratory tract, particularly the common cold, in elderly residents of nursing homes.[8]

Limitations

In this week's *BMJ*, Avenell et al report the results of a pragmatic, randomised, double blind, placebo controlled trial of daily supplements of multivitamins and minerals on morbidity from infections in people aged 65 and older (p 324).[9] This study found that, in older people living at home, daily supplementation with multivitamins and multiminerals over one year had no beneficial effects on self reported infections, use of health services, or quality of life.

This was a robust study overall, and it largely confirms previous research. Having said that, all studies have their limitations, and the simplicity of the assessments in this trial by Avenell et al may have lead to confounding and measurement biases. For example, neither the researchers nor participants collected data on dietary intake or physical activity during the study period. And, although the trial design included a check of compliance with the supplements in a random 10% sample of participants, it did not include outcome data on biochemical status of vitamin and minerals. Two other important limitations, which the authors acknowledge, are the low doses of multivitamins and minerals used and the relatively healthy study population.

If trials of low dose supplementation show little or no benefit, might higher doses be more effective? Perhaps, but higher doses of such supplements in older people are not without risks. For instance higher doses of zinc and vitamin A supplements impair cellular immunity and the health of bones, respectively, among older people with vitamin D deficiency.[2 10] Furthermore, the results of studies using doses that exceed recommended daily requirements for micronutrients cannot be readily translated into dietary guidelines. Few studies have attempted to modulate immune status in older people using foods or doses of nutrients that are realistically achievable through changing diet.[11]

Holistic approach to diet

Diets of poor quality and quantity underlie and exacerbate many causes of major disease in older people and society as a whole including hypertension, type 2 diabetes, obesity, heart disease, stroke, cancer, mental ill health, and infections.[12] Evidence is increasing for a holistic approach to improving diet rather than focusing too closely on the effects of individual nutrients on risk factors and preventing disease. If combined with physical activity, which can increase appetite and enable a diet of marginal nutrient density to become adequate,[12] a better diet can make a substantial impact on population health, particularly of older people.

Supplements of vitamins and minerals might still benefit older people with increased risk of infections and those with evidence of vitamin deficiencies. But we

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will not know for sure until further robust studies have been done among high risk groups, including those with poor immunity and those living in institutional care.

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Roles and responsibilities of medical expert witnesses

Seek training, know the rules, take out insurance, and be rigorously impartial

After the erasure from the medical register of Professor Sir Roy Meadow on 15 July 2005, doctors acting as expert witnesses may want to remind themselves of their duties and of what might happen if they fail to discharge those duties. Doctors wishing to rise to this challenge would do well to seek training, and many such courses are advertised on the internet. This editorial deals principally with the roles and responsibilities of experts in civil litigation in England and Wales. That said, the principles are broadly applicable to litigation in the criminal and family courts and, to varying degrees, to litigation in other jurisdictions.

Expert witnesses can take sage guidance from the judgment of Mr Justice Cresswell in the "Ikarian Reefer."[1] This case involved a Panamanian vessel that ran aground and caught fire; the insurers argued that the vessel was the subject of arson by the owners, and in this regard they relied on expert evidence. The case heralded important changes in the use of expert witnesses. Mr Justice Cresswell's guidance (which is paraphrased in the box) has largely been incorporated in the Civil Procedure Rules.[2]

A joint expert

The Ikarian Reefer case was decided at a time when experts were usually instructed individually by each party rather than jointly by both parties. Nowadays, unless there is reason for doing otherwise, the parties in civil litigation will usually be required to instruct only a single joint expert.[3] The role of joint expert demands competence and rigorous impartiality. In particular, where there is a range of opinion, the expert must summarise that range and given reasons for his own opinion.[4] A joint expert bears heavy responsibility, and some lawyers are unhappy with the possibility that a poor quality expert might, in effect, decide a claim without having a full understanding of the relevant legal issues.[5] Joint experts would do well to ensure that the duties set out in the Ikarian Reefer case are second nature to them.

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In addition to such core duties and responsibilities, experts might well need to comply with certain procedural requirements specific to their jurisdiction (such as a verification of reports by a statement of truth). Experts should ensure that those who instruct them make them fully aware of all relevant procedural requirements.

The procedural requirements under the Civil Procedure Rules are unlikely to change after the Meadow case, but the criminal equivalent is still in the early stages of implementation, and the part relating to expert witnesses is still being written. Once complete, the Criminal Procedure Rules will set out—with utmost clarity—what will be expected of an expert in a criminal case.

When things go wrong

Most experts do an excellent job. But what can happen to the few who do something wrong? An expert witness who failed to comply with a procedural requirement would usually face no more than embarrassment, but failure to take heed of the guidance given in The Ikarian Reefer might lead to more serious consequences. The first and most insidious sanction would be loss of reputation. On the whole, experts are instructed on the basis of their reputation, and experts who fail in their duties will quickly be dropped from medicolegal work. Those who are not dropped may wish later that they had been. To take a recent example,[6] a High Court judge found that an expert clinician had come to a "quite staggering clinical conclusion" because he had failed to put himself in a position to know properly the facts on which he ought to have based his evidence. A finding such as this would not be an enhancement to an expert's curriculum vitae.