were indeed the primary causes of hepatosplenomegaly, should lead to a reversal of the symptoms and an improvement in the general condition of the patient.

The use of allopurinol to inhibit XO was not considered, as its efficacy in viral treatments is dosage dependent with toxicity seen at higher doses (Maeda H, personal communication). Instead, glycyrrhizin, commonly used in viral hepatitis B in Japan, was given because of its XO inhibitory activity.[6] In addition, as cysteine via glutathione reduces XO to xanthine dehydrogenase, its precursor methionine was given.[7]

Omega-3-fatty acids have the advantage of inhibiting both XO,[8] and iNOS,[9] and were administered in the form of salmon oil. The last inhibitors of iNOS applied were alpha tocopherol,[10] beta carotene,[11] and nicotinamide.[12] Ascorbic acid was given to stabilize the reduction of alpha tocopherol.

The patient was treated with this combination, designed to be a more natural inhibition of these two enzymes avoiding any possible complications potentially occurring from massive dosages of any agent alone. The treatment was begun on Saturday evening in June, 1995. In 24 hours the child was remarkably improved with almost complete reduction of his hepatosplenomegaly, no fever, no malaise and no empirical signs that he had ever even been ill. He was continued on this treatment for a week, after which he was only maintained on the omega-3-fatty acids for a month. The boy was observed daily for any signs of residual illness for the next 5 months to insure that he had not merely developed a temporary remission.

It is not yet fully determined if the entire improvement were a result of only the inhibition of XO and iNOS; however, it does indicate that there are possibilities for treatment, using this theory as a model, until we can substantiate in animal models whether or not the pure inhibitors of these two enzymes will prove as successful as the natural inhibitors. The advantage of the natural compounds is the lack of side effects and toxicity, which has not yet been shown with the new chemical inhibitors of iNOS. The fact that many other biochemical parameters are altered by these compounds is not to be denied, nor is it to be totally assumed that by only inhibiting these two enzymes one would see such incredibly rapid results as we witnessed in our patient. Follow up studies are necessary to substantiate the reliability of the application of this new method of treatment in viral diseases.

Dana F Flavin-Koenig,
Werner Tschollar, Technical University, Rechts d Isar Hospital, Munich, Germany.

1. Flavin-Koenig DF. A common enemy in toxicity? (letter). NZ Med J 1995; 108: 88.
2. Shamma'a MH, Nasraliah M, Al-Khalidi UAS. Serum xanthine oxidase, An experience with 2000 patients. Digestive Dis 1973; 18: 15-22.
3. Lui RH, Jacob JR, Hotchkiss JH, Cote PJ, Gerin JL, Tennant B. Woodchuck hepatitis virus surface antigen induces nitric oxide synthesis in hepatocytes: possible role in hepatocarcinogenesis. Carcinogenesis 1994; 15: 2875–7.
4. Fukishima T, Sekizawa K, Yamaya M, Okinaga S, Satoh M, Sasaki H. Viral respiratory infection increases alveolar macrophage cytoplasmic motility in rats: role of NO. Am J Physiol 1995; 268: L399-406.
5. Eisenstein TK, Huang D, Meissler Jr JJ, Al-Ramadi B. Macrophage nitric oxide mediates immunosuppression in infectious inflammation. Immunobiology 1994; 191: 493-502.
6. Hatano T, Yasuhara T, Fukuda T, Noro T, Okuda T. Phenolic constituents of licorice, II. Structure of licopyranocoumarin, licoarylcoumarin and glisoflavone, and inhibitory effects of licorice phenolics on xanthine oxidase. Chem Pharm Bull 1989; 37: 3005-9.
7. Cighetti G, Debiasi S, Paroni R. Effect of glutathione depletion on the conversion of xanthine dehydrogenase to oxidase in rat liver. Biochem Pharmacol 1993; 45: 2359-61.
8. Kawai Y, Takahashi S, Akira S, Kato N. Decreased activity of xanthine dehydrogenase and serum uric acid in rats fed partially hydrogenated fish oil. Nutr Res 1993; 13: 1325–30.
9. Boutard V, Fouqueray B, Philippe C, Perez J, Baud L. Fish oil supplementation and essential fatty acid deficiency reduce nitric oxide synthesis by rat macrophages. Kidney Internat 1994; 46: 1280–6.
10. Burkhart V, Gross-Eick A, Bellmann K, Radons J, Kolb H. Suppression of nitric oxide toxicity in islet cells by atocopherol. FEBS Lett 1995; 364: 259-63.
11. Hirokawa K, O'Shaughnessy B, Ramrakha P, Wilkins MR. Inhibition of nitric oxide synthesis in vascular smooth muscle by retinoids. Br Pharmacol 1994; 113: 1448–54.
12. Eizirik DL, Sandler S, Welsh N, Bendtzen K, Hellerstrom C. Nicotinamide decreases nitric oxide production and partially protects human pancreatic islets against the suppressive effects of combinations of cytokines. Autoimmunity 1994; 19: 193-8.

OOS - a new industrial malady

Since the successful prosecution by OSH against FAI insurance, there has been a minor epidemic of OOS. There are nearly 50 000 new cases of ACC claims over the past year, a 20% increase. 75% of all new ACC claims are reported to be OOS-related. OOS is now defined as "serious harm" by OSH attracting a higher level of fines in successful prosecution. The Health and Safety in Employment Act (HSE Act) places the onus for control of workplace hazards onto the employers.

This new industrial malady has lead to a plethora of ergonomic gadgets all purporting to benefit the injured workers at a great expense to the employers. This is in spite of the lack of any epidemiological studies linking the causality of OOS with poor workstation or inappropriate work practices. In fact study at Telecom Australia showed an inverse relation between the number of keyboard strokes performed and the incidence of OOS.[1,2]

However, be that as it may, we as doctors should adopt a proactive approach in preventing these loose syndrome of muscular aches and pains that occur in workers. If we fail to do so, workers would often end up with a label of "chronic pain syndrome". The employment prospect becomes very poor. It also drains on ACC.[3]

Work place assessment including work practices and task analysis is often essential. The expertise of occupational physician or industrial medical advisor should be sought early. He or she can then coordinate a multidisciplinary approach to management of OOS enlisting the help of occupational therapist, physiotherapist, counsellors and even vocational guidance.

Tony CK Chew,
Balmoral, Auckland.

1. Hocking B. "Repetition Strain Injury" in Telecom Australia. Med J Aust 1989; 150: 724.
2. Bouvier R. "Repetition strain injury" in Telecom Australia. Med J Aust 1989; 151: 356-7.
3. Brooks P. Repetitive strain injury. BMJ 1993; 307: 1298.

Control of pertussis

The recent leading article by Lennon et al[1] suggests that booster doses of pertussis vaccine at 5 years of age and perhaps into adult life should be further explored. However, these extra injections offer little benefit to their recipient and a mother could reasonably argue that her 5 year old is to be exposed to the risks of pertussis vaccination in the hope of protecting someone elses infant from the risks of infection.

Whooping cough is generally a mild illness even in the very young.[2] In Jenkinson's series of 500 consecutive cases one of the 15 children aged under one developed pneumonia. She was 5 weeks old. In an Italian study[3] there was no clinical history of pertussis in 21% of children under 4 who had positive antibodies. This indicates that those children got nothing worse than a cold as a result of their infection with pertussis.

These data are essentially incompatible with the assertion in the Lennon et al[1] paper that there is a "25-50% chance of an infant with pertusssis less than one year of age being admitted to hospital". That quote is based on data from a paper whose primary purpose was to estimate hospitalisations of, and mortality from, pertussis using two incomplete data sources and capture-recapture statistical techniques. The admissions were 0-67% of notified cases from a number of small (and some unreported) studies. This grossly overestimated the proportion of infants under 1 year of age who required hospital admission as the result of pertussis infection.

Those children with subclincal infection, those with minor symptoms who weren't taken to a doctor, those with mild illness in whom a diagnosis of pertussis was not made, and those whose infection was not notified for whatever reason were all excluded from the denominator. This introduced a fatal bias into the estimate which has a political rather than scientific use as a result.

There is no denying that whooping cough can be a serious illness. However the vaccine is neither effective nor harmless. Vaccine efficacy falls to around 50% after 4 years.[3] Short time adverse effects reported in a large study[4] of 15 572 DTP immunisations included

redness at injection site	37.4%
swelling at injection site	40.7%
pain	50.9%
fever (≥ 38° C)	46.5%
drowsiness	31.5%
fretfulness	53.4%
vomiting	6.2%
anorexia	20.9%
persistent crying	3.1%

This is an impressive list and in combination with known and suspected medium and long term effects of pertussis vaccine may well put a lot of parents off vaccination if informed consent were to be required prior to vaccination.

Until the recent leading article[1] the aim of pertussis vaccination had been to reduce (halve) hospital admissions of those aged under one suffering from whooping cough.[4] This was to be achieved by universal vaccination with a three dose regimen. However, vaccination status is not the major determinant of hospitalisation. The Glasgow study[5] showed that overcrowding in households and parental unemployment were more important. An Auckland study undertaken during the 1982 epidemic[6] found that Maori and Pacific island children were much more likely than Europeans to be admitted and that these children tended to come from a crowded home environment.

The control of pertussis in New Zealand is not a simple issue yet simplistic solutions are again being offered. The beauty of these is that their failure can be blamed (unfairly) on parents whose children are not vaccinated.

Immunisation is a sacred cow and we have lost the ability to critically examine immunisation policies. We now regularly expose adults to the risks of diphtheria immunisation when there is no diphtheria in New Zealand. Yet how often is a tetanus vaccination preceded by the obtaining of informed consent? Indeed how many vaccinators are truly capable of fairly presenting the case against diphtheria vaccination?

Pertussis cannot be eradicated from New Zealand using the current vaccine as it gives only partial protection against infection and does not prevent (although it reduces) transmission.

One unforeseen consequence of universal age-cohort pertussis vaccination has been the development of susceptible parents who have lost their vaccine induced immunity and are now liable to infect or be infected by their infants.

The aim of halving the number of children aged under one admitted to hospital with pertussis will more reliably be achieved by full employment and the provision of adequate housing for all than by any immunisation campaign. This is a political problem and it is inappropriate for public health workers, no matter how well intentioned, to accept responsibility for it.

There is a good argument for healthy children who live in uncrowded well off homes, especially those born in the 2 full years between epidemics, to be left to acquire immunity as the result of natural infection – such immunity may well follow subclinical infection and will probably be lifelong.

Rhys Cullen
Avondale, Auckland.

1. Lennon D, Reid S, Holdaway D, et al. Control of whooping cough in New Zealand; slow progress. NZ Med J 1995; 108: 495-7.
2. Jenkinson D. Natural course of 500 consecutive cases of whooping cough: a general practice population study. BMJ 1995; 310: 299-302.
3. Jenkinson D. Duration and effectiveness of pertussis vaccine: evidence from a ten year community study. BMJ 1988; 296: 612-4 .
4. Reid S, Lennon D, Thomas M, O'Connor P, Baker M, Mansoor O. Petussis control in New Zealand. NZ Med J 1994; 107: 460-6.
5. MacLure A, Stewart GT. Admission of children to hospitals in Glasgow: relation to unemployment and other deprivation variables. Lancet 1984; 2: 682-5.
6. Forsyth K, Farmer K, Lennon DR. High admission rates of infants and young children with whooping cough: clinical aspects and preventive implications. Aust Paediatr J 1984; 20: 101-3.