CORRESPONDENCE

Anti HBs protection in hospital workers vaccinated against hepatitis B: policy implications of a pilot study

Sir,—Hepatitis B virus infection, a vaccine preventable disease that can cause serious morbidity and mortality, is known to be an occupational risk for health care workers who are repeatedly exposed to blood and body fluids.[1 2] The recent article by Cockcroft *et al*[3] confirmed results of other studies of hepatitis B immunisation among health care workers[4–6] that have yielded antibody response rates of around 95% or greater. They also confirmed the previously known effect on antibody response of age[7] and of injection site,[1 8 9] and suggest that routine post vaccine serology is unnecessary, which is consistent with the recommendations in Canada[1] and the United States.[2] Several important points, however, that were not dealt with by Cockcroft and her colleagues merit consideration.

The long term protection afforded by the hepatitis B vaccine has been questioned,[8–11] and although the need and timing of booster doses in previously vaccinated persons are not yet known with certainty, Canada's National Advisory Committee on Immunisation (NACI) has recently recommended one booster dose five years after completion of the initial course of immunisation.[1] Although Cockcroft *et al*[3] noted an excellent antibody response rate to hepatitis B surface antigen (anti HBs) 12 weeks after three doses of vaccine, they did not show whether adequate concentrations persisted over time. Also, presumably the authors would agree that post exposure serology is warranted in immunised health care workers, as is the general recommendation elsewhere.[1 2]

The hepatitis B immunisation programme offered to high risk health care workers in our 1100 bed health care facility seems to be equivalent to that proposed by Cockcroft *et al*[3]; specifically, a three dose series (0, one, and six months) of hepatitis B vaccine (Heptavax-B or Recombivax-HB; Merck, Sharp, and Dohme) is properly administered into the deltoid muscle. In 1988 there were 421 individually reported accidental exposures to blood and body fluids, of which 40 were to known positive sources of hepatitis B surface antigen (HBsAg); of these exposed employees, 10 had been previously vaccinated, one of whom had a post exposure non-protective concentration of anti HBs (below 10 IU/l) despite having been vaccinated only 30 months earlier.

A retrospective study was therefore conducted on 60 health care workers (42 women, 18 men) who presented for serological testing either post exposure or as part of a group of dialysis workers concerned about their degree of protection. All had previously completed a properly administered initial course of immunisation within the past six years and were in good health. Their mean age was 37 (range 26–57). The serological testing (1985–9) was performed at the Cadham Provincial Laboratory. Anti HBs were measured by a standard radioimmunoassay procedure (Abbott Laboratories Ltd, Montreal, Canada). Results were interpreted as negative (non-protective) if below 10 sample ratio units (SRU) and positive (protective) if above 10 SRU.[1]

By contrast with the less than 5% non-response rate reported by Cockcroft *et al*[3] and others[4–6] within months of completion of the vaccine course, we found that 21·7% (13/60) had inadequate post vaccination anti HBs concentrations. This percentage was higher (29·4%) among persons 40 years or older (5/17). Of 40 staff tested one to five years post immunisation, 10 were found to have non-protective concentrations of anti HBs. In fact, more than 24% (9/37) of vaccinated workers had inadequate anti HBs concentrations within three years of a properly administered initial vaccine course; in at least three cases, protective concentrations had been documented previously, thus indicating loss of antibodies over time rather than primary vaccine failure. This agrees with previous findings.[9 11] Importantly, 12 of the 13 subjects found to have inadequate concentrations did respond to a booster.

Because of the high incidence of hepatitis B exposure even in this area of low endemicity, and in view of our findings of the high levels of unprotected state, we believe that the issue of timing of a booster dose is critical. Also, despite small numbers, our findings reinforce the need for post exposure serology. Cockcroft *et al*[3] tested their cohort some two years ago. It would be useful to know if the high level of antibody response reported has persisted.

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Anne Cockcroft and Paul Griffiths reply:

We read with interest the correspondence from Yassi and his colleagues referring to our paper (1990;**47**:199–202). We agree that effects of age and injection site have been reported by