The prevalence and direct costs of pre-immunization testing for hepatitis A in general practice

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SUMMARY

Two hundred and twenty patients in one general practice travelling to destinations where immunization against hepatitis A virus (HAV) is recommended were tested for their HAV immune status before immunization. Age-specific prevalence of prior immunity to HAV was estimated. The relative costs of pre-immunization testing and immediate immunization were compared. The most cost-effective testing method for this practice was found to be total population testing prior to immunization with HAV vaccine. Individual general practices can estimate the optimal age at which to commence testing for HAV in their own practice population.

Keywords: hepatitis A; immunization; immune status.

Introduction

SINCE the introduction of the first hepatitis A Virus (HAV) vaccine in 1992, the options for prophylactic immunization have widened.[1] The choice between screening a population by testing for antibodies to HAV, and then vaccinating those found to be negative, and immunizing the entire population, without prior testing, depends on the relative costs of the vaccine and the HAV serology test, and the prevalence of antibody to HAV in the population.[2] The age-specific seroprevalence of antibody to HAV is known to vary throughout the UK.[3] Seroprevalence of antibody to HAV was measured within a general practice population of patients intending to travel to areas where immunization is recommended. In addition, costs were compared for the following options: immunizing all individuals; HAV testing of the whole population, with subsequent immunization of the seronegatives; and the nationally recommended policy[1] of testing and subsequent immunization only for those aged over 50 years, individuals with a history of jaundice, or those who were born in areas of high to moderate prevalence.

Method

From June 1993 to April 1995, all patients travelling abroad, in whom HAV vaccine was indicated, were screened. Blood specimens were taken at the surgery and anti-HAV antibody status assessed. Patients found to be anti-HAV antibody negative were offered the recommended three-dose course of HAV vaccine (cost £40.80, British National Formulary).

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Age-specific prevalences were calculated with their 95% confidence intervals (95% CI). Each of the three options was costed according to two prices of the HAV test that may be charged to general practices: the actual cost to the practice, £4, or the nationally quoted cost, £10. The cost of nursing time was calculated as £1.50 for 10 minutes.

Results

Two hundred and twenty patients were screened who had requested HAV vaccine and were travelling to areas where immunization is recommended. The overall prevalence of antibody to HAV was 31.8% (95% CI 25.9–38.3%). The prevalence of antibody to HAV increased with age (Table 1), from 20.9% (95% CI 14–28.6%) in those aged less than 50 years to 45.8% (95% CI 35.6–56.3%) in those aged 50 years or more.

The cost of immunizing the whole population who requested HAV vaccine was nearly £9966. Pre-immunization testing for all saved £1961 (£4 a test) or £641 (£10 a test). The national policy of testing those aged over 50 and immunizing the seronegatives, and immunizing all patients aged less than 50, saved £1510 (£4 a test) or £889 (£10 a test).

Discussion

The cost-effectiveness of testing for HAV in this practice depends on the cost of the HAV test. At £4 a test, the policy of testing all eligible patients is the cheapest option, being £451 cheaper than the recommended policy of testing those aged over 50 years. At £10 a test, the nationally recommended policy is cheaper by £248 when compared with testing all patients. Break-even analysis shows that testing individuals aged over 50 years becomes the cheaper option for this practice once the cost of the test is greater than £7.75.

General practices can estimate the direct costs of testing for HAV in their practice populations. It is worthwhile testing at age i, provided that the cost of testing is less than the expected savings. Hence, if I and S are the costs of immunization and testing, respectively, and Pi is the seroprevalence at age i, testing is worthwhile provided that the ratio of the cost of testing to the cost of immunization (S/I) is less than the seroprevalence Pi. The optimal policy is to test to the age where the marginal costs of testing equal the marginal savings $(Pi=S/I)$. For this practice, with the cost of the serology test at £4, the ratio S/I is 0.1 and testing is worthwhile above age 30; when the cost of the test rises to £10, and the ratio S/I increases to 0.25, testing would be worthwhile for ages over 40 (Table 1).

The schedule for HAV vaccine has changed from three to two doses. Consequently, one fewer visit to the practice is needed, saving £1.50 per visit. The relative costs of the testing policies did not change significantly.

The optimal policy for each practice depends on age-specific prevalence and the ratio of costs of testing to immunization, not just on age. As seroprevalence varies throughout the UK[3] and costs of testing depend on a locally negotiated price, no national policy will be optimal for every practice. Thus, it is worthwhile for general practices to establish the likely age-specific preva-

Table 1. Seroprevalence of antibodies to hepatitis A by age.

	Age group (years)				
	1–29	30–39	40–49	50–59	>60
Number of persons antibody positive to HAV	0	8	18	18	26
Prevalence estimate (Pi)	0	0.25	0.30	0.33	0.62
Lower 95%CI	0	0.11	0.18	0.21	0.46
Upper 95%CI	0	0.43	0.42	0.47	0.76

lence to HAV in their local population and to negotiate a competitive price for the HAV test. In addition, risk factors such as a past medical history of jaundice, or being born in an area where HAV is endemic, are highly predictive of anti-HAV immunity.[4,5]

General practitioners are currently paid an item of service of £5.15 for each HAV immunization.[6] Therefore, a financial incentive exists for immunizing patients irrespective of their serological HAV status. The optimal policy for this practice, compared with immunizing all patients, saves the NHS about £1000 a year but means an annual potential loss of fees of £180; the savings to the NHS when comparing the screen-all policy with the nationally recommended policy are £835, with a loss of practice fees of £420 each year.

Finally, the costs estimated in this study were only concerned with direct costs to the practice. No account was taken of the likely costs to patients, or their preferences for testing and subsequent immunization. More detailed studies that take account of these factors are needed before the national policy of selective testing of the over-50s can be appraised. Until then, individual practice policy should be adjusted with reference to the cost of the HAV serology test and the likely seroprevalence to HAV in the practice population.

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