SEROLOGIC MARKERS OF HEPATITIS - B INFECTION IN BRONCHIAL ASTHMA

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(Received for Publication, March 1934)

ABSTRACT

Subjected to frequent parenteral drug and allergen administration, patients with bronchial asthma are likely to be at risk of contracting hepatitis B infection. In addition, those receiving immunotherapy are subjected to more frequent parenteral medication and hence are at a greater risk than those on only pharmacologic therapy.

This problem was studied among 60 patients with bronchial asthma—30 on immunotherapy and 30 on pharmacotherapy. A higher prevalence of Hepatitis B surface antigen (HBs Ag) among patients with bronchial asthma than in the general population was detected but no difference was found between the two groups.

Introduction

Patients with bronchial asthma are subjected to frequent parenteral drug and allergen administration, particularly those on immunotherapy ('Hypersensitisation'). They may thus be expected to be at risk for developing hepatitis B virus infection.

Dividing the patients into two groups—those on immunotherapy with symptomatic pharmacotherapy (I) and those on pharmacotherapy alone (P), the subjects were studied for the prevalence of HBs Ag and anti-HBs as serologic markers of Hepatitis B infection among these two groups.

Material and Methods

Thirty consecutive patients with bronchial asthma on immunotherapy with symptomatic pharmacotherapy and 30 consecutive patients on pharmacotherapy alone were chosen for the study. They were comparable with respect to the severity, duration of asthma, age and sex of the subjects.

Work up of the patients included detailed clinical history and examination, with emphasis on the type of asthma (intrinsic or extrinsic), the duration, severity and mode of treatment employed. Detailed drug histories were obtained in each case as also the history of jaundice in the past. Routine investigations included skiagrams of the chest and of the paranasal sinuses, total and differential counts and relevant blood and urine examination. Endermal skin testing was carried out to determine the allergens to which the patients were sensitive.

All samples of blood for HBs Ag were drawn using autoclaved syringes, needles, an aseptic technique and sterile test tubes. HBs Ag and anti-HBs determinations were carried out using the reverse passive hemagglutination technique (RPHA) by the method of Kachani and Gocke, (1973[1]).

These specimens were also tested using the less sensitive counter immuno electrophoresis (CIEP) technique. (Gocke and Howe, 1970[2]).

Washings from syringes, needles and stock solutions of allergens in the clinic were also examined for HBs Ag.

In the present series CIEP, a second generation technique and RPHA, a third generation technique were adopted.

In an earlier phase of the study, 175 patients with bronchial asthma, 34 in the (I) group and 141 in the (P) group were evaluated by the authors in a similar manner. They were studied by the less sensitive CIEP technique alone as this was the only test available at that time.

Results

The age and sex distributions are shown in Table-1.

TABLE—1

AGE AND SEX DISTRIBUTION

Age/years	Immunotherapy group (I)		Pharmacotherapy group (P)	
	Male	Female	Male	Female
10–19	5	1	1	0
20–29	2	3	4	0
30–39	5	1	7	11
40–49	3	1	3	2
50–59	4	2	2	0
>60	1	2	0	0
Total	20	10	17	13

Majority of patients in both the groups were in the age range of 20-49 years.

Table-2 gives details of the infection in asthmatic subjects studied in two phases.

TABLE—2

SUBJECTS WITH VIRUS INFECTION

Phase	Group	No. pts	HBs Ag+ve				Anti HB+ve	Jaundice	
			CIEP		RHPA				
			No.	%	No.	%	No.	No.	%
I	I	34	1	*2.9*	–	–	0	4	*11.7*
	P	141	12	*8.5*	–	–	2	30	*21.2*
II	I	30	2	*6.7*	3	*10*	0	5	*16.7*
	P	30	2	*6.7*	4	*13*	0	2	*6.7*

In phase I of the study involving a group of 175 subject CIEP results were as follows: Thirty four had been on immunotherapy and 141 on pharmacotherapy; the overall prevalence of positive HBs Ag was observed in 13 (7.4%) of 175 subjects.

Thus, the distribution was one (2.9%) of 34 subjects in the (I)-group and 12 (8.5%) of 141 in the (P)-group. Anti HBs was positive in two cases, both in the (P)-group.

History of jaundice was recorded in 34 cases; four in the (I)-group and 30 in the (P)-group. None of them was HBs Ag+ve. One case was anti HBs positive in the pharmacotherapy group.

Of the subjects in phase II, three (10%) of the 30 subjects were positive in the (I)-group and four (13%) of 30 in the (P)-group. Thus, seven (11.6%) of the patients of the study in phase II were positive for HBs Ag, none being positive for anti HBs.

Seven of 60 patients gave a history of jaundice, five, in the (I)-group and two in the-(P) group. None of them were HBs Ag or anti HBs positive.

Eight patients had a history of steroid administration, six in the (I)-group and two in the (P)-group. Three of these were positive for HBs Ag, two in the (I)-group and one in the (P)-group.

CIEP method on the same 60 specimens could pick up, only four [2(I), 2(P)] out of the seven positives by the RPHA technique (Table-2).

Washings from the syringes, needles and allergen stock solutions were negative for HBs Ag in the allergy clinic.

Discussion

The therapy of bronchial asthma often involves parenteral administration of agents (drugs and allergen). The increased risk of transmitting infections by syringes has been recorded both by laboratory experiments (Evans and Spooner, 1950[3]; Fleming and Ogilvie, 1951[4]) and of hepatitis in population subgroups such as diabetes, syphilitics (Laird, 1978[5]), those receiving tetanus toxoid (Capps *et al*, 1948[6]) and those receiving pentothal and penicillin (Dermady and Hardwich, 1945[7]). The possibility of BCG vaccination without the use of dispossable needle and syringe for each individual transmitting hepatitis B infection has also been entertained (Zuckermann, 1978[8]).

In a previous study, the prevalence of serologic markers of Hepatitis B infection was studied in childhood asthma and HBs Ag was found in 4.4% of childhood asthmatics as against 1.4% in controls (Somu 1982, unpublished observation).

The results of the present study show that the prevalence of (11.6%) HBs Ag positives among asthmatics is higher than that of 1.6% found in the normal population in a previous study by Thiagarajan *et al*, (1978[9]). While patients on immunotherapy may be expected to have a higher prevalence of HBs Ag, since they are more often given parenteral therapy (allergens), the present study showed no greater prevalence ($P>0.05$), in this group as compared with those on pharmacotherapy. The previous phase of the study using the less sensitive CIEP showed a significant ($P<0.05$) difference of prevalence between the two groups. While the result of the earlier study could suggest that immunotherapy may have a nonspecific booster effect on the host immune response and consequently reduce HBs Ag prevalence, a finding which arose out of the less sensitive CIEP study, it is more likely that the study by RPHA reflects the true state of affairs i.e. there is no difference between the pharmacotherapy treated and immuno therapy groups in respect of hepatitis B infection; procedures of sterilization etc. are apparently effective in the allergy clinic preventing transmission of the infection to the immunotherapy group.

None of the patients with jaundice had HBs Ag or anti-HBs positivity and none of those positive for the above markers had a history of jaundice. The latter observation is not surprising since cases of hepatitis B infection could be anicteric.

While three of eight patients who had a history of steroid intake were HBs Ag positive (two in the (I)-group and one in the (P)-group) the small number of the samples precludes any inference on the possible effect of steroid therapy on hepatitis B infection.

The present study indicates that patients with bronchial asthma, like other population subgroups who may often receive parenteral therapy, have a higher prevalence of HBs Ag but there is no significant difference in the prevalence of the infection between pharmacologically treated group of patients and those on immunotherapy.

Acknowledgement

The authors acknowledge with thanks the kind permission of the Dean, Madras Medical College, and Director of Medical Education, Tamil Nadu for permission to conduct this study. The assistance of Thiru C. V. Gopalakrishnan, non-medical asst., (Bio-chemistry), Allergy Clinic in carrying out the work and secretarial assistance of Mr. K. Thyagarajan are also acknowledged.

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