

A STUDY OF PREVALENCE OF HEPATITIS B SURFACE ANTIGEN AMONG PREGNANT WOMEN

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Introduction

It has been seen that the presence of "Hepatitis B surface antigen" is a potential source of infection in serum. Serum of infants whose mother had HBsAg (Hepatitis B surface antigen) during the last trimester of pregnancy also revealed the presence of HBsAg. This particular transmission is because of materno fetal circulation or close contact between the mother and child during the post-partum period. It has been seen recently that excretion of HBsAg in milk is one of the most important source of infection in neonatal hepatitis (Beasley and Stevens 1975; Krugmen, 1975).

It was therefore the intention of the present study to find out the rate of prevalence of HBsAg by routine screening of pregnant women during the last trimester of pregnancy using serological methods, so that the incidence of neonatal hepatitis can be checked.

Material and Methods

The overall evaluation of 500 pregnant

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women attending antenatal clinic was done as follows—

(1) A detailed clinical evaluation to rule out the possibility of any associated systemic disease.

(2) Collection of fresh serum for testing for the presence of hepatitis B surface antigen by:

(a) Two dimensional micro ouchterlony gel diffusion technique (Blumberg, 1965).

(b) Countercurrent immuno-electrophoresis (Zuckerman, 1970).

(3) Patient's blood group was also found out by conventional method (ICMR, 1971).

Observations

The evaluation of 500 pregnant women according to age group showed that 38% were in the age group of 15-20 years, 42% were in age group of 21-25 years, while the remaining 20% had grouped belonging to 26 to 45 years (Table I).

The maximum prevalence of HBsAg carrier state was seen in the age group of 21-25 years, 3 (1.43%) and the remaining 2 (1.05%) belonged to age group between 15-20 years (Table I).

Positive HBsAg carrier state in different blood groups was observed in 5 (1.0%) subjects of which 4 (0.8%) were

TABLE I
Incidence of HBsAg Carrier State at Different Age Groups in Pregnant Women

Age group in years	No. of sera tested (Percentage)	No. of sera positive	Percentage
15-20	38.0	2	1.05
21-25	42.0	3	1.43
26-30	14.4	—	—
31-35	4.0	—	—
36-40	1.6	—	—

TABLE II
Prevalence Rate of HBsAg Among Different Blood Groups Pregnant Women

Blood group	No. of sera tested (Percentage)	No. of sera/positive	Percentage
A	21.0	—	—
B	30.0	1	0.67
AB	7.0	—	—
O	42.0	4	1.90

having blood group 'O' while 1 (0.2%) was of group 'B'.

Maximum number of subjects were primipara (35.2%), about 28.7% were 2nd gravida, while remaining 36.1% were studied under the remaining three gravida groups (Table III). The carrier state for HBsAg was observed in 3.40% in 3rd gravida and 1.40% in 2nd gravida (Table III).

TABLE III
Prevalence Rate of HBsAg Carrier State in Relation to Gravida Status to Pregnant Women

Gravida state	No. of sera tested (Percentage)	No. of sera positive
1st gravida	35.2	—
2nd gravida	28.6	2
3rd gravida	17.6	3
4th gravida	11.02	—
5th gravida or more	7.6	—

The conventionally available screening technique of agar gel diffusion showed total 4 (0.8%) cases for HBsAg carrier states from the test group. On the other hand, counter current immuno-electrophoresis technique yielded one additional positive case in the test group for HBsAg carrier state. An overall prevalence of 1% in pregnant women was recorded in HBsAg positivity (Table IV).

TABLE IV
Prevalence of HBsAg Carrier State Determined by Agar Gel Diffusion (AGD) and counter Current Immune Electrophoresis Techniques in Pregnant Women

No. of sera tested	No. of sera positive	
	By AGD	By CIEP
500	4(0.8%)	5(1.0%)

Discussion

The prevalence of HBsAg in normal population, voluntary blood donors and

pregnant women has shown wide variations from different parts of India and abroad in various studies (Blumberg *et al.*, 1965, 1968; Paul and Dutta, 1973 and Dutta and Sen 1975).

Authors in the present work have noticed an increased antigenemia among age group of 15-25 years females (Table I) because they come in the contact with the diseased and contacts frequently. The subjects of this age group are exposed to the antigen more frequently as compared to the others, moreover as the age advances the level of antigenemia and immunological response of body becomes too low to be recognised by conventional method (W.H.O. Tech. Report, 1976). Some of the workers (Schiff *et al.*, 1975) are of the opinion that the difference of HBsAg carrier state in relation to the different age groups between pregnant and non-pregnant women might be due to some unidentified immunological mechanisms which have an important bearing in determining the susceptibility to hepatitis B virus. It has been further substantiated by Shammuguo *et al.*, 1978. Authors are in direct confirmity to the observations made by the above workers.

We have observed a high incidence of positivity of HBsAg in the subjects with blood group 'O' and 'B'. It signifies increased prevalence of 'B' and 'O' group in the general population (ICMR, 1971), or it might be due to an increased propensity of antigen to various blood group specific proteins. None of the previous studies revealed any such correlation and so it needs more elaborative study.

Prevalence of HBsAg among healthy pregnant women has varied at various places. Pall *et al.*, 1973 at Chandigarh have shown a prevalence rate of 0.51%, Shammugun *et al.*, 1978 as 3.0% and Papavengoleu, 1974 reported 3.4% posi-

tivity of HBsAg. Our observations are consistent with the observations made by these workers, but in variance to Hills *et al.*, 1970 who reported total absence of HBsAg in pregnant women, while Beasley and Stevens, 1975 have shown a vary high prevalence rate (16.5%).

It is possible that the indiscriminate use of syringes, sexual transmission of the disease (Heathcote *et al.*, 1977) might be contributory factors in inducing an altered immune status in pregnancy as well as in the development of persistent carrier state in pregnant female. Stevens and Beasley 1975 reported a very high incidence of vertical transmission of HBsAg (50%) inspite of absence of breast feeding, they correlated this fact to the blood bath of the baby during parturation as well as close personal factor.

As evident from detection of an additional positive case, the counter current immuno-electrophoresis technique is comparatively more sensitive as well as less time consuming, as compared to agar gel diffusion technique, which is in agreement to results of Sama and Sarla 1973.

On the basis of present work, it is mandatory for every pregnant female to undergo well planned routine antenatal screening for detection of HBsAg which may be of great help in prevention of incidence and severity of neonatal hepatitis.

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