

## Review of the status of the HBsAg among the pregnant women attended primary health care centers (PHCCs) in Medina, Saudi Arabia between 2008 and 2010.

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**Abstract: Background:** The high prevalence of hepatitis B antigens in pregnant women is considered the most important factor contributing to the higher carrier rate of HBsAg in some populations, including Saudi Arabia (SA). Screening for hepatitis B virus (HBV) infection in pregnant women is a well established and evidence based standard of current antenatal care practice. **Objective:** To review of the status of the HBsAg among the pregnant women attended primary health care centers (PHCCs) in Medina, Saudi Arabia between 2008 and 2010. **Methods:** A cross sectional study was conducted using especially designed checklist. Review of antenatal care records of the years 2008, 2009, 2010 of five randomly chosen PHCCs; including 3060 pregnant women was done. Data was presented using mean, standard deviation, and percent. Chi square test, one way Anova, and linear regression were used. **Results:** HBsAg sero-positive cases decreased from 4.9% at 2008 to 2.9% at 2010. More than half of sero-positive cases (53.5%) aged more than 30 years. Gravidity and parity nearly remained the same over years but abortion and rate of caesarean sections (CS) were increased. Significant predictors for HBsAg sero-positive status were elder age group, increased parity, increased abortion, CS as a mode of previous delivery, history of blood transfusion and previous surgical maneuvers. **Conclusion:** The HBsAg positive cases among Saudi pregnant women decreased. Age at HBsAg assessment, parity, abortion, mode of previous delivery, history of blood transfusion and previous surgical maneuvers were predictors for HBsAg sero-positive status.

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**Key words:** Pregnant women, antenatal care, sero- prevalence, hepatitis B virus

**Abbreviations:** Hepatitis B virus (HBV), Primary Health Care Centers (PHCCs), Caesarian sections (CS), Saudi Arabia (SA)

### 1. Introduction

Worldwide, hepatitis B infection remains a problem of socio-economic and public health concern. It is one of the world's greatest infectious disease problems. (1) The carrier rate of HBV varies geographically where the majority of Eastern Mediterranean Region countries are classified as intermediate or high endemicity zones. The prevalence of HBV sero-positive state in Saudi Arabia ranged from 7.4% to 17%. (2,3) The vertical transmission i.e. from mother to child, which occurs mainly at time of parturition is one of the most important modes of transmission of HBV (4) Therefore, the high prevalence of hepatitis B surface antigen (HBsAg) in pregnant women is considered the most important factor contributing to the higher carrier rate of HBsAg in some populations, including Saudi Arabia. (5) In Saudi Arabia, HBV vaccination program in infancy was implemented since 1990. (5) Later on, another program for universal HBsAg screening program of all pregnant women was launched. (6) Implementation of both programs definitely could reduce chronic carrier state over

about 20 years of their implementation. Therefore, this study was conducted to study the HBsAg sero-prevalence among pregnant women and its trend over the past 3 years.

### Objective

To review of the status of the HBsAg among the pregnant women attended primary health care centers (PHCCs) in Medina, Saudi Arabia between 2008 and 2010.

### 2. Subjects and Methods

A retrospective health-facility based study was conducted over a period of four months (January 2011 through April 2011). Review of the antenatal records of five randomly selected PHCCs from different districts of Medina City (out of 31 centers representing the entire Medina PHCCs to be feasible and representative for the entire PHC Medina centers) for the years 2008, 2009 and 2010 was done using especially designed checklist. Registration of the data of all pregnant women who attended and registered in the antenatal records was done (There

was no other governmental centers for antenatal care). The designed checklist included socio-demographic data (age, education and work status), period of gestation in weeks at first antenatal care, obstetric history (gravidity, parity, abortion, previous mode of delivery), history of previous surgical maneuvers and history of previous blood transfusion and HBsAg state. Analysis for their HbsAg status was performed in the central lab of the ministry of health using the ELISA technique. Data of 3060 women were collected (representing all the registered pregnant women in the records under the study). Ethics Review Committee reviewed and approved the proposal.

### Statistical analysis

Statistical Package for Social Sciences SPSS version 13 was used. Frequencies, percentages and arithmetic mean were calculated. Chi-square test, ANOVA test, and linear regression were used to find out predictors. *P* value <0.05 was considered significant.

### 3. Results

The overall mean age of the studied pregnant women was  $25.4 \pm 7.5$  years with statistically significant upward trend of the age at assessment of HBsAg ( $p=0.000$ ); where it was  $24.3 \pm 6.91$  at 2008 and  $26.7 \pm 8.20$  at 2010. Of them, 27.6% aged below

20 years, 28.1% aged 20-25 years and 14.3% more than 35 years. Nevertheless 59.9% got high education only 31.0% were currently employed; with significant upward increase in the number of working pregnant in 2010; being 28.4% at 2008 and 38.4% at 2010 ( $p=0.000$ ) (Table 1).

The mean gravidity was  $2.2 \pm 1.21$ , parity  $1.2 \pm 1.17$ ; with insignificant difference between studied years meanwhile significant difference was noticed for number of abortions ( $p=0.002$ ) and number of CS with an upward trend; being 33.2% at 2008 and becoming 41.1% at 2010 ( $p=0.000$ ). There is also significant upward increase in the number of pregnant who had history of previous surgical maneuvers from 28.9% at 2008 up to 49.5% at 2010 ( $p=0.003$ ) Meanwhile history of blood transfusion remains nearly the same over years of the study. (Table 2).

There is decreasing percent of HBsAg sero-positive cases (Figure 1); being 4.9% at 2008, 3.6% at 2009 down to 2.9% at 2010. HBsAg sero-positive cases have an upward trend in relation to woman age; where it was 10.1% for those below 20 years and 30.4% for those aged more than 35 years. (Figure 2) Significant predictors for HBsAg sero-positive cases were age, parity, abortion, mode of previous delivery (CS), history of both blood transfusion and surgical maneuvers. (Table 3)

**Table 1: Socio-demographic characters of the studied women**

	2008 (n=1037)		2009 (n=1015)		2010 (n=1008)		Total		P-value
	N	%	N	%	N	%	N	%	
<b>Age at HBsAg assessment in years:</b>									<b>0.000*</b>
15-	333	32.1	257	25.3	254	25.2	844	27.6	
20-	305	29.4	310	30.5	246	24.4	861	28.1	
25-	170	16.4	175	17.3	171	17.0	516	16.9	
30-	122	11.8	142	14.0	136	13.5	400	13.1	
35+	107	10.3	131	12.9	201	19.9	439	14.3	
<b>Mean <math>\pm</math> Sd</b>	24.3 $\pm$ 6.91		25.4 $\pm$ 7.25		26.7 $\pm$ 8.20		25.4 $\pm$ 7.5		<b>0.000*</b>
<b>Nationality</b>									<b>0.000*</b>
Saudi	859	82.8	988	97.3	953	94.5	2800	91.5	
Non Saudi	178	17.2	27	2.7	55	5.5	260	8.5	
<b>Education</b>									0.209
Basic	438	42.2	400	39.4	389	38.6	1227	40.1	
High	599	57.8	615	60.6	619	61.4	1833	59.9	
<b>Occupation</b>									<b>0.005*</b>
House wife	743	71.6	710	70.0	657	62.2	2110	69.0	
Employed	294	28.4	305	30.0	351	34.8	950	31.0	

\* *p*- value is significant at level <0.05

**Table 2: Obstetric history of the studied women**

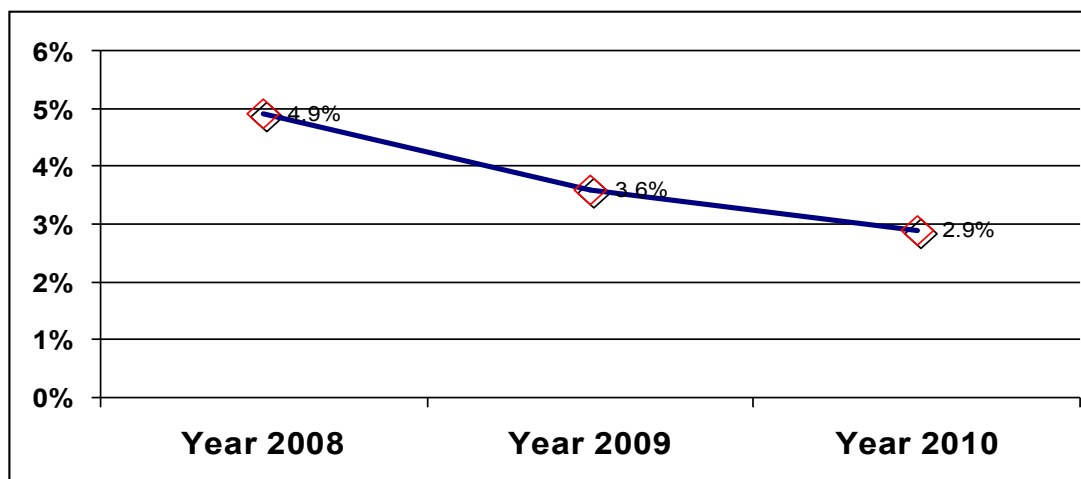
	2008		2009		2010		Total		P-value
	N	%	N	%	N	%	N	%	
<b>Gravida</b> Mean ± SD	2.2 ± 1.16		2.3 ± 1.22		2.3 ± 1.25		2.3 ± 1.21		0.081
<b>Para</b> Mean ± SD	1.1 ± 1.14		1.2 ± 1.15		1.2 ± 1.22		1.2 ± 1.17		0.244
<b>Abortion</b> Mean ± SD	0.1 ± 0.30		0.1 ± 0.37		0.1 ± 0.30		0.1 ± 0.33		<b>0.002*</b>
<b>Gestational age in weeks at assessment of HBsAg</b>	7.0 ± 2.82		6.9 ± 2.80		7.1 ± 2.87		7.0 ± 2.83		0.481
<b>Mode of previous delivery for multipara: (n=1927)</b>									<b>0.000*</b>
Normal	350	55.6	278	58.3	333	51.3	1061	55.1	
Caesarian section	209	33.2	178	27.5	270	41.1	657	34.1	
Others	71	11.2	92	14.2	46	7.1	209	10.8	
<b>History of Blood transfusion for any reason:</b>									0.981
No	897	86.5	879	86.6	870	86.3	2646	86.5	
Yes	140	13.5	136	13.4	138	13.7	414	13.5	
<b>History of other surgical maneuvers:</b>									<b>0.003*</b>
No	737	71.1	626	61.7	509	50.5	1872	61.2	
Yes	300	28.9	389	38.3	499	49.5	1188	38.8	

\* p- value is significant at level <0.05

**Table 3: Significant predictors for HBsAg sero-positive studied cases**

	SE	Beta	t-value	Sig.	R <sup>2</sup>	F
<b>Year of the studied record</b>	.0	-.3	-4.1	.036	.58	45.4
<b>Age at HBsAg assessment</b>	.3	1.1	12.1	.023	.61	20.1
<b>Parity</b>	.2	.9	9.6	.033	.55	9.1
<b>Abortion</b>	.0	.4	7.5	.011	.51	11.2
<b>Mode of previous delivery</b>	.0	.3	4.6	.023	.63	15.8
<b>History of blood transfusion</b>	.4	.2	5.7	.041	.59	25.9
<b>History of surgical maneuvers</b>	.0	.5	8.9	.039	.51	23.1

SE: Standard Error

**Figure 1: Percent of HBsAg sero-positive cases**

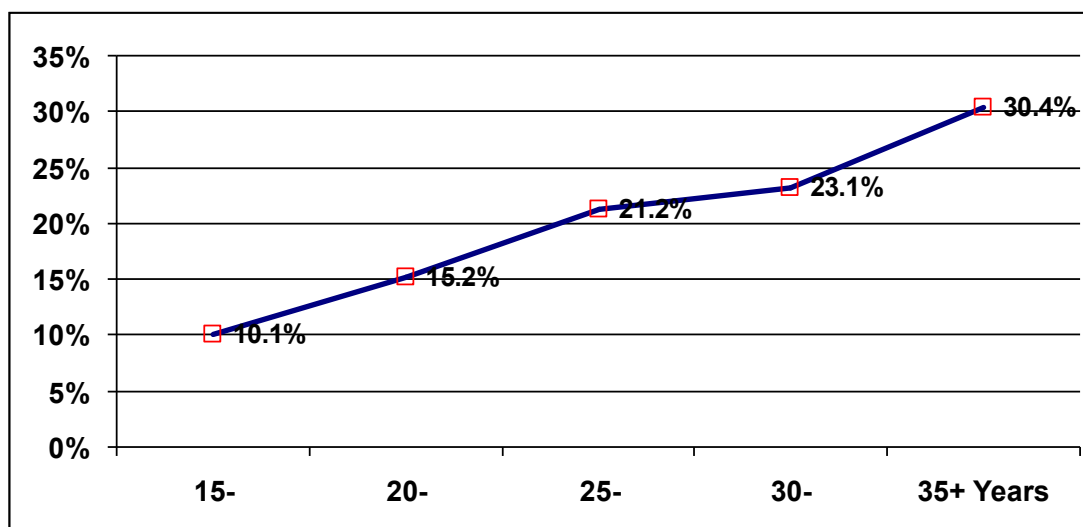


Figure 2: HbSAg sero-positive cases by age group

#### 4. Discussion

Hepatitis B virus (HBV) infection is a major public health problem in the Middle East. The chronic carriers of HBV form the reservoir of infection for susceptible adults and newborn infants. Even when not infected during the perinatal period, children of HBV-infected mothers remain at a high risk of acquiring HBV infection by horizontal transmission during the first 5 years of life. (7) Also it has been established that there is a racial and geographical variation in the frequency of neonatal transmission.(8)

In Saudi Arabia, the overall prevalence of hepatitis B surface antigen (HBsAg) was high ranging from 7.4 to 17%. (9,10) Different regions of Saudi Arabia showed a significantly variable prevalence of HBsAg. (9)

Since selective screening of pregnant women for HBV has failed to identify a high proportion of HBV-infected mothers (11), pre-natal HBsAg testing of all pregnant women is now recommended. (12) Universal HBsAg screening of pregnant women to prevent perinatal HBV infection has been shown to be cost saving. (6) Previous studies showed that the prevalence of HBsAg among Saudi pregnant females ranged from 3.9 to 12.7%. (13,14)

The present study shows that the seroprevalence of HBsAg was dropped from 4.9 % in 2008 to 2.9 in 2010. This is somewhat comparable to the <2.6% reported by Al-Mazrou and colleagues (15) and far less than that reported by Al-Shamahy in the study conducted in Yemen (16) and by El-Hazmi.(9)

Al-Mazrou and colleagues proved that history of surgical procedures was associated with a higher (3%), but not significantly higher rate of

HBsAg positivity. This was concomitant with the results of the current study where it is one of the significant predictors for HBsAg seropositive cases. They concluded that there was no significant association between HBsAg positivity and a history of dental procedures or blood transfusion. (5) This was not true for the present work where blood transfusion found to be one of the significant predictors for HBsAg seropositive cases.

Jurema *et al.*(17) have previously shown that Hepatitis B immunization in the postpartum period is feasible and effective. The availability of a safe and effective hepatitis vaccine (18) encourages health planners to accelerate viral elimination, and additional intervention such as Hepatitis B immunization in postpartum women can thereon be undertaken. Thus, Hepatitis B immunization can be recommended, giving the first dose immediately on the first postpartum day before the mother gets discharged from the hospital; and the second dose to coincide with her child's first vaccination dose at the age of 2 months, and a third dose to be given to the mother when her child gets vaccinated at the age 6 months. However, further studies to assess the feasibility as well as effectiveness of such a program are necessary.

#### Study Limitations

Study design which was a retrospective is one from the limitations that hinder the development of a trend for HBsAg sero-prevalence.

#### 5. Conclusion and Recommendation

The HBsAg positive cases among Saudi pregnant women decreased but the full impact of the hepatitis B vaccination program in infancy will take

more years to decrease the prevalence rate in pregnant women. The ministry of health should continue to give the first dose of hepatitis B vaccine at birth to prevent early acquisition, but in the meantime a regional policy can be adopted to deal with the relatively high prevalence rate of HBsAg among pregnant Saudi women.

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