

# Positive hepatitis B surface antigen after vaccination in a newborn

Mariana Martins<sup>1</sup>, Ivete Afonso<sup>1</sup>, Alexandrina Portela<sup>1</sup>, Rui Almeida<sup>1</sup>

## ABSTRACT

Hepatitis B vaccination is included in the Portuguese national health plan. Vaccine-induced hepatitis B surface antigen positivity is described in literature, leading to diagnostic errors if the serological test is prematurely performed after vaccination. We report the case of a false positive transient B surface antigenemia in a premature baby born from a hepatitis B vaccinated mother. Caution is required when seropositivity is found after administration of hepatitis B vaccine in order to avoid anxiety in parents and unnecessary exams.

**Keywords:** Hepatitis B surface antigen; Hepatitis B virus; Vaccination

## POSITIVIDADE DO ANTIGÉNIO DE SUPERFÍCIE DO VÍRUS DA HEPATITE B APÓS VACINAÇÃO NUM RECÉM-NASCIDO

### RESUMO

A vacina da hepatite B faz parte do programa nacional de vacinação português. A positividade para o antígeno de superfície do vírus da hepatite b induzida pela vacina está descrita na literatura, o que pode conduzir a erros diagnósticos se a serologia for feita prematuramente após vacinação. Reporta-se um caso de deteção de um falso positivo transitório num recém-nascido prematuro de uma mãe vacinada. Sugere-se prudência na interpretação de um resultado seropositivo após administração da vacina da hepatite B, de forma a evitar a ansiedade parental e exames desnecessários.

**Palavras-chave:** Antígeno de superfície da Hepatite B, vacinação; vírus da hepatite B

Nascer e Crescer – Birth and Growth Medical Journal  
2018; 27(2): 105-7

<sup>1</sup> Department of Pediatrics, Hospital Pedro Hispano, Unidade Local de Saúde de Matosinhos. 4454-509 Matosinhos, Portugal.  
mariana.martins@ulsm.min-saude.pt; ivete.afonso@hotmail.com;  
alexandrina.portela@ulsm.min-saude.pt; rui.almeida@ulsm.min-saude.pt

## INTRODUCTION

Hepatitis B is a potentially-complicated, vaccine-preventable infectious disease which can be acquired through vertical transmission.

The American Academy of Pediatrics advises that a birth dose of the hepatitis B vaccine is given to all infants prior to discharge from the hospital, except when their weight is less than 2000 grams, in which case the vaccine must be postponed.<sup>1</sup>

In Portugal, the anti-hepatitis B vaccine is administered in the first 48-72 hours after birth and at the age of two and six months.<sup>2</sup>

Transient hepatitis B surface antigenemia after vaccination has been described with mono (Engerix B® GlaxoSmithKline) and multi-valent vaccines (Infanrix-Hexa® GlaxoSmithKline, Pediarix® GlaxoSmithKline).<sup>3,4</sup>

Neither the incidence nor the duration of the antigenemia have been clearly defined. Rysgaard *et al* advised for a delay in hepatitis B surface antigen (HBsAg) testing until at least 15 days after vaccination based in an adult population retrospective study. On the other hand, they also concluded that a weakly positive HBsAg uncommonly reflects actual HBV infection.<sup>5</sup> Otag *et al* describe a HBsAg antigenemia duration of less than three days in three out of 44 adult blood donors after vaccination against hepatitis B.<sup>6</sup> Regarding the pediatric population, two studies show an incidence of HBsAg antigenemia of 55% and 65% after vaccination, with a peak in incidence in the second and third days post-vaccination and a duration that can exceed one week.<sup>7,8</sup> Mantadakis *et al* described the case of a 70-day-old boy who was mistakenly diagnosed with acute hepatitis B after he was found to be seropositive for the hepatitis B surface antigen, thus advising caution when interpreting a positive HBsAg test that obtained within 28 days after immunization.<sup>5</sup>

If unrecognized, this transient antigenemia can lead to unnecessary stress and laboratory retesting expenses.

## CLINICAL CASE

We present the case of a newborn with 35 weeks and four days of gestational age, born by vaginal delivery after labor induction due to an intrauterine growth restriction and an altered fluxometry of the umbilical artery, with a birth weight of 1975 grams. Apgar scores were seven and nine at one and five minutes, respectively, with the neonate requiring positive pressure ventilation after birth.

There was no significant maternal history: the mother had been vaccinated for hepatitis B in childhood and had a negative screening for hepatitis B virus (HBV) surface antigen on the third trimester of her pregnancy.

The baby was admitted to the neonatal intensive care unit in the context of a transient tachypnea and a hypoglycemia.

During the hospital course, this baby also had mild jaundice with unconjugated hyperbilirubinemia that required phototherapy. That was attributed to prematurity and resolved within a couple of days. Transaminases were normal for the age group.

On the 17 day of life (38 weeks of adjusted age), the newborn received the anti-HBV vaccine (10 mcg, Engerix B® GlaxoSmithKline). Six hours later, during a scheduled venous puncture, a pregnant nurse accidentally pricked herself with the needle. According to the hospital policy, a standardized serological panel was performed both to the nurse and the baby including hepatitis B surface antibody and antigen.

In the newborn, both the HBsAg and the Anti-HBs were positive, 13.72 UI/mL (reference value <1.0 UI/mL) and 63.50 UI/mL (reference value <5.0 UI/mL), respectively. The infant was clinically well and remained well at regular surveillance, never revealing pathological signs on physical examination.

After a period of 16 weeks, the blood test was repeated showing a negative HBsAg and a positive and protective titer of Anti-HBs (99.88 mUI/mL).

## DISCUSSION/CONCLUSION

Hepatitis B infection can lead to serious long-term complications including hepatocellular carcinoma and liver failure especially when acquired in infancy. At present, vaccination is the only effective strategy available to prevent this infection. HBV vaccine has been shown to be highly immunogenic and safe. However, vaccination may create false positive results since the immunologic agent of the vaccines and serologic marker are the same, which could be confused with acute hepatitis B infection.<sup>4,9</sup>

In our patient, both the hepatitis surface antigen and antibody were positive. We interpreted these results as a successful hepatitis B immunization with passive transmitted maternal antibodies and a transient surface antigenemia. The weakly positive HBsAg titer was another clue to this hypothesis as well as the absence of sign of disease in the baby. Few publications exist regarding the appearance of HBsAg in neonates, infants and children after vaccination, however this case was consistent with recent literature, which describes false positive results 24 to 72 hours postvaccination and even a case after 90 minutes.<sup>3,4,9</sup>

In our case, we chose to repeat the serologies for hepatitis B after a significant period of time, coinciding with a scheduled bloodwork, thus avoiding unnecessary punctures procedures in such a young child. However, the duration of the antigenemia was unknown. With this case, the authors remind that in neonates born from HBV vaccinated mothers the probability of vertical transmission is negligible and a transient antigenemia is expected after vaccination. Caution is required when seropositivity is found after administration of hepatitis B vaccine in order to avoid anxiety in parents and unnecessary exams.

## REFERENCES

1. Hepatitis B. In: Larry KP, editor. Red Book: Report of the Committee on Infectious Diseases. 26th ed. Elk Grove Village: Committee on Infectious Diseases American Academy of Pediatrics; 2003. p. 318-36.
2. Direção geral de saúde. Norma número 040/2011 de 21 de dezembro. Programa nacional de vacinação 2012.
3. Fleischer L, Syed S. Hepatitis B Surface Antigenemia in a Neonate Following Vaccination With Pediarix. *Clinical Pediatrics*. 2009; 48:311-2.
4. Mantadakis E, Thomaidis S, Efraimidou EN, Ramatani A, Chatzimichael A. Transient hepatitis B surface antigen circulation after Infanrix-Hexa®: a case report and review of the literature. *European Journal of Pediatrics*. 2010; 169:1139-41.
5. Rysgaard CD, Morris CS, Drees D, Bebbber T, Davis SR, Kulhavy J, *et al.* Positive hepatitis B surface antigen tests due to recent vaccination: a persistent problem. *BMC Clinical Pathology* 2012; 12:15.
6. Otag F. False positive HBsAg result in blood donors due to administration of three different recombinant DNA Hepatitis B vaccines. *Vaccine* 21, 2003; 25-26:3734-7.
7. Bernstein SR, Krieger P, Puppala BL, Costello M. Incidence and duration of hepatitis B surface antigenemia after neonatal hepatitis B immunization. *J Pediatr*. 1994; 125:621-2.
8. Challapalli M, Naidu V, Cunningham DG. Hepatitis B surface antigenemia in a newborn infant after vaccination. *Pediatr Infect Dis J*. 1993; 12:408-9.
9. Lunn ER, Hoggarth BJ, Cook WJ. Prolonged Hepatitis B Surface Antigenemia After Vaccination. *Pediatrics* 2000;105: E81.

## CORRESPONDENCE TO

Mariana Martins  
Department of Pediatrics  
Hospital Pedro Hispano  
Unidade Local de Saúde de Matosinhos  
Rua Dr. Eduardo Torres  
4454-509 Matosinhos  
Email: mariana.martins@ulsm.min-saude.pt

Received for publication: 06.12.2017

Accepted in revised form: 11.12.2017