Opinion

Screening for early detection of bile duct atresia through QR code

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Cinthia Bastianelli, Adriana Spiess, Analia Gallardo, Margarita Ramonett
Hospital Publico Materno infantil Salta, Argentina

Correspondence: Cinthia Bastianelli, Hospital Publico Materno infantil Salta, Argentina, Email cvbastianell@gmail.com

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Opinion

Bile duct atresia (BAA) is the most common cause of obstructive jaundice in the first three months of life and is responsible for 40% to 50% of all liver transplants in children worldwide. Although the etiology of AVB is unknown, it is associated with developmental anomalies, ischemic phenomena, arterial malformations, and viral infections.[1]

AVB is an inflammatory, obstructive and idiopathic process of the bile ducts that evolves to biliary cirrhosis, affecting the intra- and extrahepatic bile ducts, which ends with fibrosis and obliteration of the biliary tract with the development of biliary cirrhosis, portal hypertension and liver failure, causing death within 2 to 3 years of life, if there is no surgical intervention. Early surgery, hepato-porto enteroanastomosis (Kasai surgery), before the first two months of life, offers the best chance of long-term survival of the patient with native liver.[2]

In the follow-up of patients with AVB after portoenteroanastomosis, more than half normalize bilirubin within six months after surgery and 5-year survival with the native liver is 30% to 60%. Approximately 20% of patients undergoing surgery survive beyond the age of 18. The level of serum bilirubin after surgery is the most important evolutionary predictor. Its normalization anticipates a favorable evolution in the long term.[3]

It is estimated that the worldwide prevalence of the disease ranges from 1 in 6000 to 19,000 live newborns (Taiwan: 1:6,000; USA: 1:12,000; Europe: 1:18,000; Canada 1:19,000), it occurs in all regions of the world, but it is more common in Asian countries and in women.[4] There is a firm consensus in the pediatric literature that efforts for the early detection of biliary atresia should not be delayed, since its prognosis depends on early diagnosis and treatment; This continues to be a challenge for the pediatrician.

In cases of jaundice that last beyond two weeks of life, it is essential to determine direct bilirubin without delay and always evaluate the color of the fecal matter.[5] The clinical presentation of AVB is usually a full-term newborn, with adequate weight, normal appearance, with progressive jaundice and acholia between 2 and 6 weeks of life. Coluria and discoloration of feces are important elements in the clinical examination. Hepatomegaly is always present, of increased consistency and sometimes accompanied by splenomegaly.

The diagnosis of AVB should be considered in an infant, one month old, jaundiced, with acholic stools and hepatomegaly.[6]

If portoenteroanastomosis is performed during the first 60 days of life, approximately 70% of patients restore bile flow, while after 90 days, less than 25% of operated patients will.

The detection of jaundiced infants with acholic or hypocolic stools using the screening method with colorimetric tables is feasible, simple, non-invasive and low cost. These represent a unique opportunity to detect neonatal cholestasis at an early age.[7]

Matsui and Dodoriki (1995), in Japan, developed colorimetric tables, achieving through them the Kasai operation before 60 days of life. Universal screening in Taiwan was established, using a similar method, increasing the sensitivity for AB detection from 72.5% to 97.1% from 2004-2005.[8]

In our country, a pilot, prospective, observational study was carried out at the Prof. A. Posadas National Hospital (1999-2002), using the fecal screening method with printed colorimetric cards (Figure 1), in all newborns born. in the hospital and were treated at the first month's check-up. Of a total of 12,484 children, 4,239 (33.9%) attended the first month's visit with the colorimetric card. 18 were identified with hypo/acholic stools, of which only 4 presented cholestatic disease. The definitive diagnoses were: Alagille syndrome, luetic hepatitis, transient neonatal cholestasis and gallstones. Although no case of BA was identified, the screening test proved to be useful for detecting other causes of CN. Based on this experience, it was decided to implement screening with colorimetric cards as a routine practice in that hospital. Until now, this strategy allowed the detection of children with neonatal cholestasis born in the hospital, but monitored in peripheral centers. Quick communication with the hospital allowed the referral and performance of the Kasai. With the experience gained since 1999 to date at the Posadas Hospital we think and work hard so that this strategy can be used throughout the country.

For this reason, currently from the Children's Gastroenterology Unit of the Maternal and Child Public Hospital of Salta Argentina, this neonatal screening for early detection of AVB was developed in an innovative way using technology. A QR Code is used that is attached to the vaccination card of the RNs (Figure 2) who are born in the Hospital and the comprehensive health care card of the children of the province (Figure 3), as well as on the posters (Figure 4) with information from the investigation distributed in hospitals and health centers in the province.[9]

This code directs to a survey that contains contact information, affiliations of the mother and child, and the colorimetric table (Figure 5) of the stools. It must be completed by our patients' caregivers between 15 and 30 days of life, in order to compare the color of the stools with those in the table. If you mark the numbering from 1 to 4 in the table, which corresponds to acholic stools, it is suggested that adults consult quickly with their pediatrician and then be referred before 45 days of life to a gastroenterologist who will complete the studies if necessary.[10]

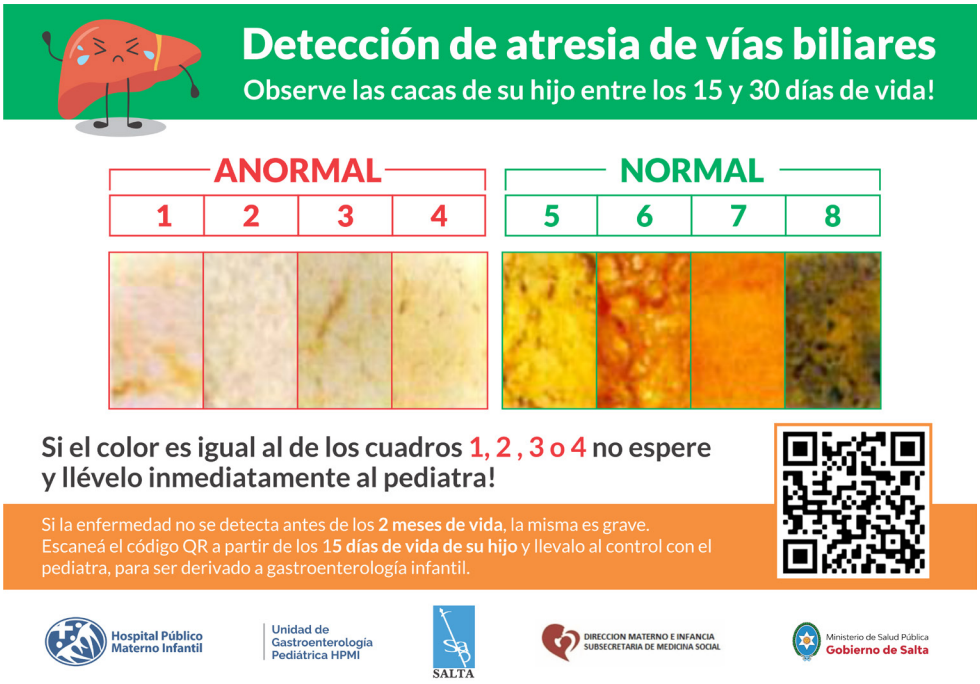

Figure 1

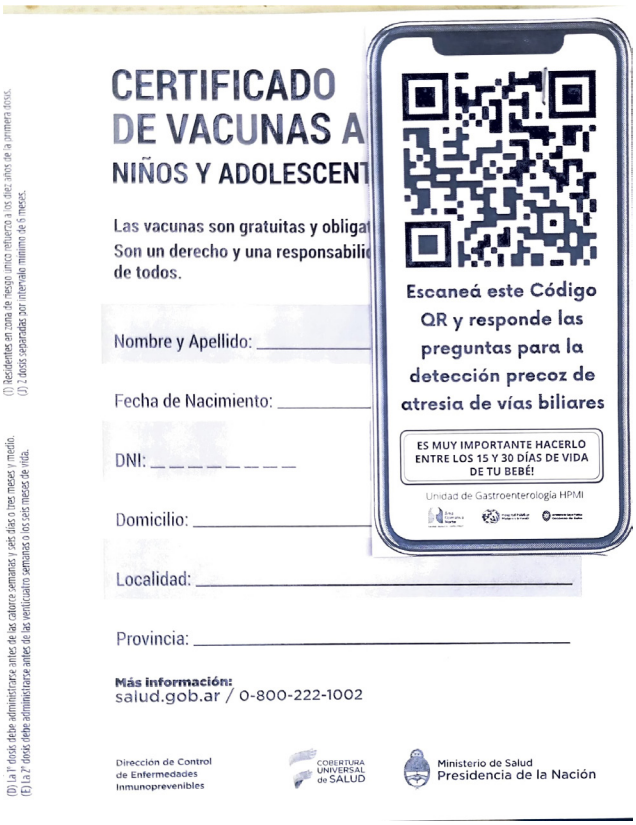

Figure 2

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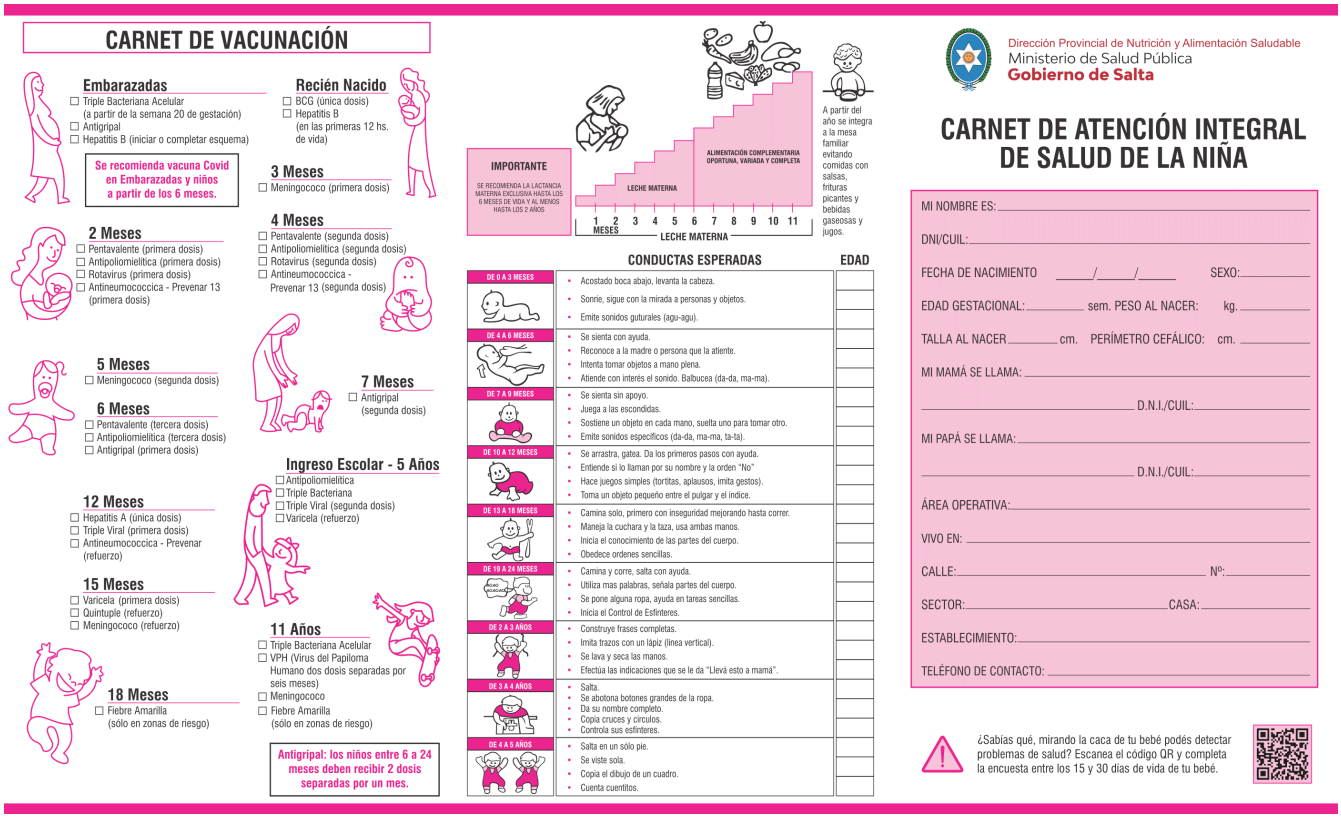

Figure 3

Figure 4

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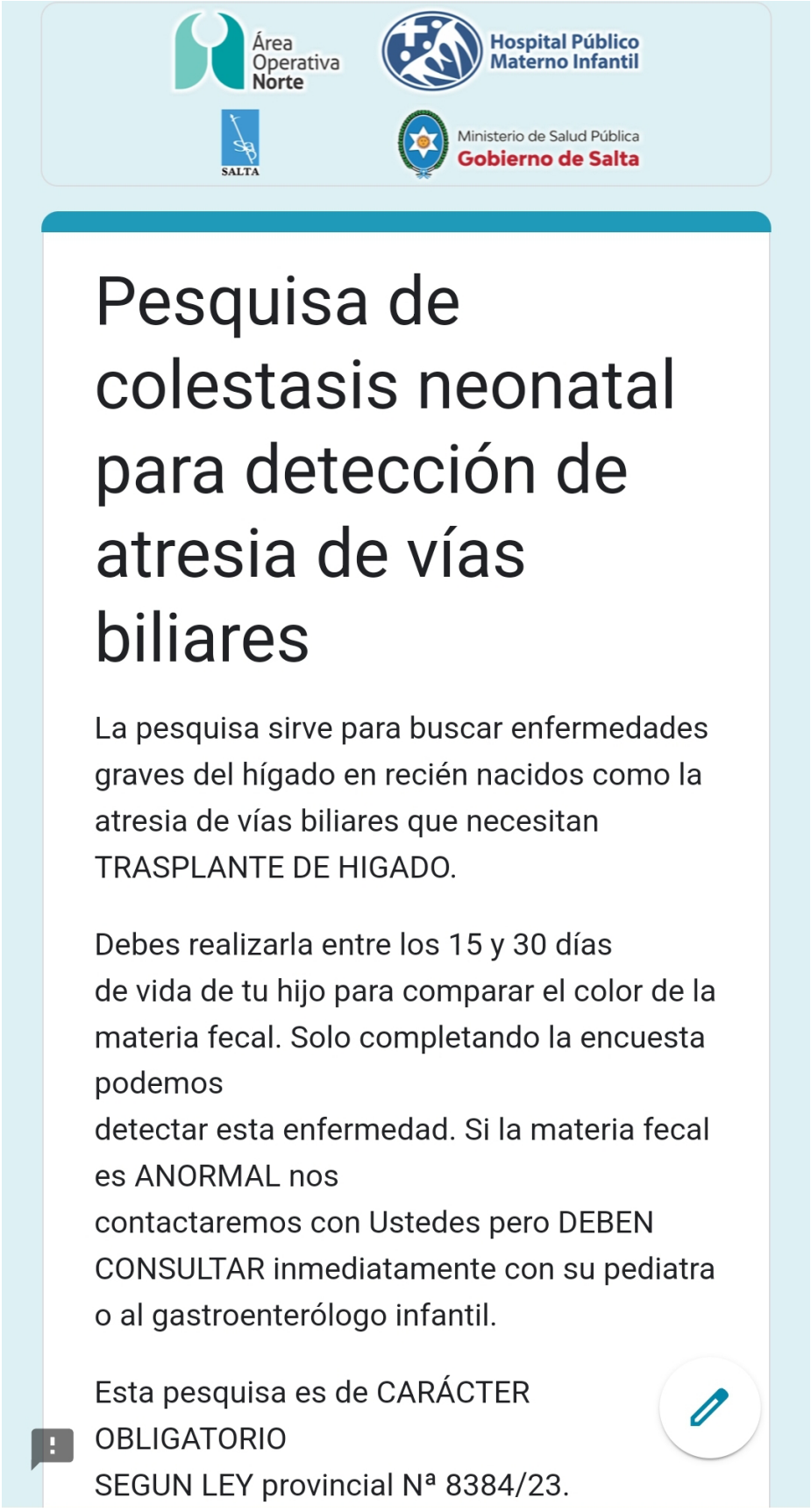

Figure 5

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Our unit controls the responses received weekly and corroborates the marked numbering. If abnormal numbering is detected, the family member is summoned through the hospital's Telemedicine to confirm or rule out acholia and evaluate the patient.[11] This AVB screening program has been in operation for 15 months and so far we have detected 3 patients with cholestasis, of which 1 presented AVB and another 2 presented other causes of cholestasis. We obtained more than 2725 responses (35%) from newborns in the hospital.

This project was approved by the Secretariat of Maternity and Childhood of the Ministry of Health of the province, as well as, it was approved by the Gastroenterology and Nutrition committees of SAP Branch Salta and by the Hepatology Committee at the Central level. In addition, the Neonatal Cholestasis law has just been approved in the province.[12]

Our ultimate goal is that all newborns in the province of Salta and the country can use this screening to detect AVB before 45 days of life and achieve early surgery that improves their prognosis and quality of life.[13]

Conflicts of interest

None.

Acknowledgments

None.

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