

Hepatitis B infection among Iraqi children: the impact of sanctions

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العدوى بالتهاب الكبد البائي بين الأطفال العراقيين: مغبة العقوبات

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الخلاصة: درست مغبة العقوبات على توافر لقاح التهاب الكبد البائي ومعدل حدوث التهاب الكبد الفيروسي البائي بين الأطفال العراقيين، وذلك في الفترة بين حزيران/يونيو 2000 وحزيران/يونيو 2001، وشملت الدراسة أسر المرضى الذين يزورون مختبر الصحة العمومية في الموصل للمتابعة حول التهاب الكبد البائي وذلك بإجراء اختبارات المقايمة المناعية للممتر المرتبط بالأنزيم (الإليزا) لتحري المستضد السطحي لالتهاب الكبد والمستضد السطحي لالتهاب الكبد البائي والمنضاد للالتهاب الكبد البائي. وقد شملت الدراسة 74 من الأطفال المولودين بين عامي 1994-1998 على أنهم حملة للمستضد السطحي لالتهاب الكبد البائي. ومن بين هؤلاء أسرع 62 من آبائهم وأمهماتهم لاستشارة مراكز التطعيم، فحصل 21 منهم فقط على جرعة واحدة من اللقاح فيما لم يتمكن 41 منهم من الحصول على أية جرعة من اللقاح. وكان المستضد الغلافي لالتهاب الكبد البائي إيجابياً لدى تسعة أطفال (14.5%) وكان المضاد لالتهاب الكبد البائي إيجابياً لدى خمسين منهم (80.7%). وكانت المقاومة التي أبدتها 12 من الوالدين سبباً لعدم تلقيهم التلقيح. وقد تم توثيق نقص اللقاحات في السنوات التي ولدت فيها الحالات المدروسة وذلك حتى بعد تطبيق القرار 986 الذي أصدره مجلس الأمن.

ABSTRACT Effect of sanctions on hepatitis B vaccine availability and occurrence of viral hepatitis B among Iraqi children was studied. Between June 2000 and June 2001, families of patients attending the Public Health Laboratory, Mosul, for hepatitis B follow-up were screened. Enzyme-linked immunosorbent assay was used to test for HBeAg, HBsAg and anti-HBe. We diagnosed 74 children born 1994-1998 as HBsAg carriers. For 62 of 74 cases, parents had consulted vaccine centres promptly: 41 were not vaccinated and 21 had only one vaccine dose. HBsAg marker was positive for 9 (14.5%) and anti-HBe for 50 (80.7%). Parental reluctance was the reason for non-vaccination for 12. Vaccine shortages during the birth years of cases were documented, even after implementation of United Nations Security Council Resolution 986.

L'infection par le virus de l'hépatite B chez les enfants iraqiens : impact des sanctions

RESUME L'effet des sanctions sur la disponibilité du vaccin contre l'hépatite B et la survenue de l'hépatite virale B chez les enfants iraqiens a été étudié. Entre juin 2000 et juin 2001, les familles des patients consultant au Laboratoire de santé publique de Mossoul pour le suivi d'une hépatite B ont fait l'objet d'un dépistage. La technique ELISA a permis la recherche de l'AgHBs, de l'AgHBe et de l'anti-HBe. Nous avons diagnostiqué 74 enfants nés entre 1994 et 1998 comme porteurs de l'AgHBs. Pour 62 des 74 cas, les parents avaient consulté dans des centres de vaccination rapidement : 41 n'étaient pas vaccinés et 21 n'avaient reçu qu'une dose de vaccin. Le marqueur de l'AgHBe était positif pour 9 patients (14,5 %) et l'anti-HBe pour 50 (80,7 %). La réticence des parents était la raison de la non-vaccination pour 12 enfants. Les pénuries de vaccins durant les années de naissance des cas étaient documentées, même après l'application de la Résolution 986 du Conseil de Sécurité des Nations Unies.

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Introduction

Infection with hepatitis B virus (HBV) is of global importance and is one of the major diseases of humankind. The scale of public health problems posed by HBV is large and over 250 million carriers exist worldwide. In developing countries, infants and children form carrier pools and infection occurs through mother-child transmission or close contact among children [1]. The probability of becoming a chronic carrier is substantially greater following infection during infancy and early childhood with increases in incidence of HBV-induced serious liver sequelae [2]. Hepatitis B vaccine has an outstanding record of safety and effectiveness. The vaccine has been licensed since 1982 and the World Health Organization strongly urges all countries to use it in national immunization programmes. The cost of the vaccine, wars and sanctions have been obstacles to its introduction and to shortages in many countries.

Before 1990, Iraq was a middle-income country with integrated public health services. The Gulf War and the subsequent sanctions imposed upon Iraq in August 1990 created a humanitarian crisis from the massive degradation of the country's infrastructure and the decline in public health services [3]. Infectious disease control programmes were disabled and shortages of medicines and vaccines became common because of the sanctions. Millions of people, especially children, women and the elderly, are still suffering from its consequences. The lifestyle of the Iraqi people has changed and a significant number of families have moved to rural areas to work in agriculture, where public health services are insufficient and shortages of medicines and vaccines are evident. The oil for food programme was implemented by United Nations Security Council Resolution 986 in

December 1996 to correct the humanitarian crisis created by the sanctions imposed on Iraq since 1990.

Mosul is the second biggest city in Iraq with a population of approximately 2 million. The main vaccine store of the Health Directory of Mosul is responsible for vaccine delivery to the primary health care centres that vaccinate infants and children. The amount of vaccine received by the city depends on the amount present in the stores of the Ministry of Health. The demand of hepatitis B vaccine in Mosul is estimated to be 250 000 doses per year according to local health records. A humanitarian crisis has been created by the sanctions imposed on Iraq since 1990 and infection control measures have been greatly damaged [4,5]. Health authorities are still working, however, through the screening of blood donors and other blood products to prevent parenteral routes of spreading HBV. This has led to the diagnosis of many acute or chronic carrier cases. The screening of contacts and relatives of infected cases has enabled us to identify more carrier cases.

The aim of this study was to investigate the effect of sanctions in Mosul on the availability of hepatitis B vaccine for children and its impact on the occurrence of viral hepatitis B cases among children there.

Methods

From June 2000 to June 2001, 74 hepatitis B surface antigen (HBsAg) positive carrier children were identified and evaluated. All were born during sanctions, between 1994-1998, and their age range was 2-7 years.

It is policy at the blood banks to register the addresses of all blood donors and to

notify positive cases of HBV infection for further evaluation. Health authorities also screen contacts and family members of these cases. Among 419 contacts and family members of 76 cases of HBsAg carrier blood donors and other high-risk groups who attended the Public Health Laboratory, Virology Centre, in Mosul, North Iraq, the main viral hepatitis referral centre in that area, 254 children were screened for HBV infection. From them, 74 HBsAg positive carrier children were identified and evaluated. The vaccine cards of HBV-infected children were inspected and their parents were interviewed about their consultations at vaccine centres at the recommended time of vaccination. We recorded their reasons why the children had not been properly vaccinated. Data regarding the amount of HB vaccine in the main vaccine store and the number of HB vaccine recipients during the birth years of our cases were also collected.

The enzyme-linked immunosorbent assay technique was performed to test for HBsAg, HBeAg and anti-HBe markers. We used Biotest kits (Biotest AG, Dreieich, Germany) for HBsAg and Hepanostika kits (Organon Teknika, Boxtel, the Netherlands) for hepatitis Be antigen (HBeAg) and anti-hepatitis Be (anti-HBe). The assays were performed according to the manufacturer's instructions.

Results

In our study, 74 of 254 screened children (29.1%) were HBsAg positive. There was documentation that for 62 of our 74 cases (83.5%) parents had visited the vaccine centre at the recommended time of vaccination: 41 (66.1%) were not vaccinated and 21 (33.9%) had only 1 vaccine dose. Parental reluctance was responsible for non-vaccination in 12 of 74 cases (16.2%),

HBeAg marker was positive for 9 of 62 (14.5%) and anti-HBe for 50 of 62 cases (80.7%). Serologic status, birth year and cause of HB vaccine noncompliance for the 62 cases were compared to the quantity of vaccine received in Mosul during each birth year of infected children (Table 1). More children who were HBsAg positive were born in years with severe vaccine shortages in Mosul (Figure 1). Furthermore, the number of HB vaccine doses that reached the city spiked in 1997, the year of the first shipment of food and medicines into Iraq following the implementation of UN Security Council Resolution 986; there were

Table 1 Serologic status, vaccination uptake and birth years of 62 HBsAg carrier children and number of hepatitis B vaccine doses received during 1994–1998^a

Variable	HBsAg carrier children	
	No.	%
<i>Serologic status</i>		
HBeAg	9	14.5
Anti-HBe	50	80.7
<i>Vaccination status</i>		
Not vaccinated	41	55.4
Low uptake	21	28.4
<i>Birth year</i>		
1994	10	16.1
1995	17	27.4
1996	12	19.5
1997	8	12.9
1998	15	24.2
<i>HB vaccine doses received in:</i>		
1994	40 000	
1995	6 000	
1996	80 000	
1997	130 000	
1998	20 000	

^aThe city of Mosul demand of hepatitis B vaccine per year was 250 000 child doses.

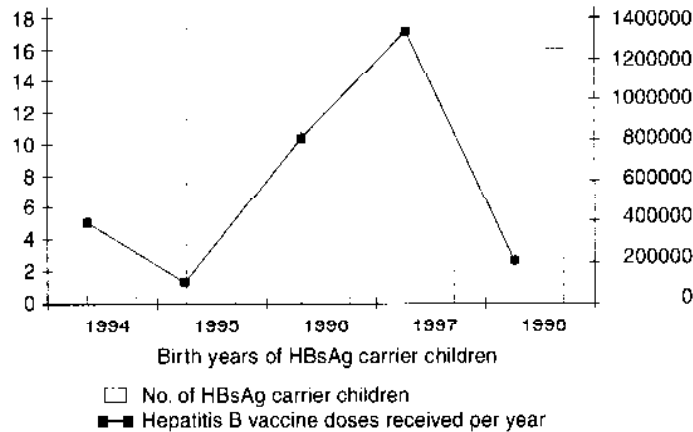


Figure 1 Number of vaccine doses received during the birth years of 62 HBsAg carrier children (1994–1998). Annual demand of hepatitis B vaccine was 250 000 child doses. United Nations Resolution 986 was implemented in December 1996.

fewer HBsAg positive children born in that year than in any other year between 1994 and 1998 (Figure 1). However, the number of vaccine doses received fell in 1998, the second year of sanctions, resulting in more HBsAg carrier children being born in that year.

Discussion

Iraq is an area of intermediate endemicity of HBV infection [6]. Prevalence rates of HBV infection have been studied throughout the country and among different occupations and the primary routes of transmission that have been proposed are intrafamilial, non-sexual and non-parenteral [7–9]. Among adults, the annual sporadic cases of acute and carrier hepatitis B have been mostly from unpredictable sources [9]. The HBsAg carrier rate among the normal population was estimated to be 4.3% and the prevalence of anti-HBs was 30%. The frequency of HBeAg and anti-HBe among carriers was estimated to be 20%

and 65% respectively [10]; the majority represent a state of childhood infection with persistence into adulthood rather than new exposure to the virus [8–9]. High carrier rates were detected among hospital workers and foodhandlers with the detection of delta hepatitis viral infection among some carriers [11,12]. HBV status among Iraqi children is not well studied but is thought to be similar to other Middle Eastern countries in that HBsAg carrier rates are high between 1 and 2 years of age and HBeAg positivity peaks around the age of 5 years [7,13].

Iraq was a pioneer among Middle Eastern countries in introducing the hepatitis B vaccine. The Iraqi Viral Hepatitis Committee hoped that this vaccine together with other strategies would control hepatitis B infection. The importation of sufficient amounts of vaccines in the early 1980s allowed for the vaccination of high-risk groups. In the late 1980s, hepatitis B vaccination was introduced as a 'routine vaccination' as part of the Expanded Programme

on Immunization. Children who escaped vaccination or who did not complete the vaccination schedule had a very low chance of vaccination later in life, because adult vaccination was obligatory only in certain high-risk groups.

After sanctions, efforts were made to maintain childhood vaccination programmes, including hepatitis B vaccination, to prevent infectious disease occurrence among children using the available vaccine doses in the main stores. The breakdown of vaccination programmes was inevitable with the prolonged years of sanctions. Therefore, many children are either not vaccinated against hepatitis B or have escaped one or two doses. Because of this situation, a new susceptible pool of children has been added to the existing reservoir of adult carriers of hepatitis B.

We found that HBV child carrier cases accumulated during sanctions. Our finding is supported by data documenting the drastic shortages of vaccine doses reaching Mosul in the birth years of infected children, especially before and after the launching of UN Security Council Resolution 986. We have included only cases identified through the policy of screening family members and contacts of infected blood donors, the problem might be found to be more serious if a large-scale study

were to audit hepatitis B vaccine uptake among children in the years of vaccine shortages. Non-completion of other vaccine types was also recorded. Parental reluctance may play only a small part in these escapes, and perhaps they are also the result of sanctions because of the need to work in rural areas, far from vaccination centres, and not because parents were unwilling to vaccinate their children. Moreover, the presence of HBeAg carrier children carries high risk for the development of serious liver sequelae and the increased tendency for transmission to other contacts. Some of these cases will become carrier mothers themselves and perpetuate the cycle of perinatal transmission, subsequently expanding acute and carrier states and increasing the burden of liver disease in the country.

In conclusion, the present humanitarian crisis in Iraq continues to smoulder, and takes a heavy toll in human lives and health conditions. The oil for food programme designed by UN Security Council Resolution 986 and implemented in December 1996 may have improved the availability of some drugs and certain medical equipment but has not relieved the humanitarian crisis in Iraq. These economic sanctions for this prolonged period appear to have devastating consequences.

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Correction

Relationship between depression and non-adherence to anticoagulant therapy after valve replacement. A.S. El-Gatit and M. Haw. *Eastern Mediterranean Health Journal*, 2002, Vol. 9 Nos 1/2, pages 12-19.

The name of the first author should read: A.M. El-Gatit in English and عبد الغتيت القطيط in Arabic.