Short communication

Study on the diagnosis time of developmental dysplasia of the hip

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دراسة حول زمن تشخيص خلل التنسج النمائي في الورك

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الخلاصة: قام الباحثان بتحديد المدة الزمنية المُنْقَضية ريثما يتم تشخيص خلل التنسج النمائي للورك في أوروميا، بجمهورية إيران الإسلامية. فقد تم تحرِّي خلل التنسج النمائي للورك لدى 1100 رضيع (530 رضيعاً و570 رضيعة) تتراوح أعمارهم بين 1.5 و4.5 شهور، مِمَّن أُحضروا إلى العيادات الخارجية الجامعية، للتطعيم في ما بين شهرَيْ حزيران/يونيو 2001 وكانون الثاني/يناير 2002، باستخدام طريقة بارلو، وأورتولوني، والتخطيط بالموجات فوق الصوتية للتشخيص. ومن بين 105 حالة مشتبه بها، تم التثبت من عشر حالات من الإصابة بخلل التنسج النمائي للورك (في ذكرَيْن اثنَيْن وثماني إناث): سبع حالات منها شُخِّصت خلال الدراسة، في حين كانت ثلاث حالات قد شُخِّصت من قبل. وقد كان التشخيص المتأخر في هذه الدراسة، أكبر مما سجَّلته الدراسات السابقة.

ABSTRACT We determined the time till diagnosis of developmental dysplasia of the hip in Urmia, Islamic Republic of Iran. A total of 1100 infants (530 boys and 570 girls) aged 1.5–4.5 months attending university outpatient clinics for vaccination during June 2001 to January 2002 were examined for developmental dysplasia of the hip. Ortalani and Barlow methods and sonography were used for diagnosis. Of 105 suspected cases, 10 were confirmed with developmental dysplasia of the hip (2 boys and 8 girls): 7 were diagnosed during the study and only 3 cases had been diagnosed previously. This late diagnosis is far greater than reported in other studies.

Étude du délai de diagnostic de la dysplasie congénitale de la hanche

RÉSUMÉ Nous avons déterminé le délai de diagnostic de la dysplasie congénitale de la hanche à Ourmia (République islamique d'Iran). Au total, 1100 nourrissons (530 garçons et 570 filles), âgés de 1,5 à 4,5 mois et se présentant aux consultations externes de l'université pour vaccination entre juin 2001 et janvier 2002, ont fait l'objet d'un dépistage de la dysplasie congénitale de la hanche. Le diagnostic a fait appel aux manœuvres d'Ortolani-Barlow et à l'échographie. Sur 105 cas suspects, 10 cas (2 garçons et 8 filles) de dysplasie congénitale de la hanche ont été confirmés : pour 7 d'entre eux le diagnostic a été posé pendant le déroulement de l'étude, alors que seuls 3 cas avaient été dépistés avant le début de celle-ci. Un tel retard au diagnostic excède de loin celui rapporté dans d'autres études.

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Introduction

Developmental dysplasia of the hip (DDH) is the preferred term to describe the condition in which the femoral head has an abnormal relationship to the acetabulum [*1*]. DDH occurs in about 1% of all births; therefore it is considered a fairly common disorder [*2*]. The prevalence of DDH has been reported to be 1% in the Islamic Republic of Iran [*3*]. As in many other countries, there is no established recommended procedure for DDH diagnosis in the country.

Avascular necrosis is an important complication of DDH. Its prevalence in referred infants under 6 months of age has been reported to be 2.5/1000 births while that for those over 6 months of age to be 10.9/1000 births [*4*]. DDH diagnosed over 6 months after birth requires more surgical intervention and longer treatment time [*4*]. A number of lawsuits have resulted from cases of children who were only recognized to have DDH well beyond the newborn period, and thus had to have extensive surgery [*5*].

Rapid diagnosis of DDH is thus important, so in many developed countries, screening for this condition is routinely carried out and periodic review of their programmes is conducted to promote its diagnosis [*6*]. The time of diagnosis is a good marker for evaluation of DDH policy. Because we could find no data on the diagnosis of DDH in Urmia, we investigated the time and frequency of correct diagnosis of DDH in infants under 6 months of age.

Methods

The study was conducted in Urmia at 9 of 28 outpatient clinics. All infants (aged 1.5–4.5 months) brought to these clinics by their parents for routine vaccination between June 2001 and January 2002 were assessed for eligibility for the study. A questionnaire was completed by the examiner before history taking and after examination. The questionnaire included information on sex, kind of delivery, family history of DDH, rank of birth, swaddling and abnormal clinical signs (limitation of abduction, asymmetry of the skin folds, unstable hip).

Infants were suspected of having DDH if they had positive Ortolani and Barlow tests or they had a risk factor for DDH. Infants were excluded if they had skeletal deformity or neurological or muscular disorders. Ultrasound was used to confirm diagnosis.

According to the population size (3561) and estimated prevalence of disorder (1%), sample size was calculated to be 1100 and once this number had been enrolled, we stopped recruiting further infants. Infants suspected of having DDH were sent for treatment to the orthopaedic department of Motahari Hospital which is affiliated with Urmia University of Medical Sciences. All parents of the infants agreed to participate.

Data were analysed using *Epi-Info*, version 6.

Results

During the course of the study, 1100 infants were assessed by the Ortolani and Barlow tests and sonography examination (570 girls and 530 boys). Of these, 105 infants were suspected of having DDH in clinical examination. Their distribution by age is presented in Table 1. After further investigation, 10 of these infants were confirmed as having DDH; 7 were newly diagnosed cases, while the other 3 cases had been diagnosed before the current study. All cases confirmed previously were suspected clinically by examiners.

Distribution of DDH confirmed cases according to time of diagnosis is presented in Table 2.

Table 1 **Distribution of infants with and without suspicion of developmental dysplasia of the hip (DDH) in clinical examination by age**

Age (months)	Suspected cases of DDH		No suspicion of DDH	
	No.	%	No.	%
1.5	43	41.0	420	42.2
3	31	29.5	207	20.8
4.5	31	29.5	368	37.0
Total	105	100.0	995	100.0

Of the 10 confirmed cases, 2 were boys and 8 were girls. Six (6) of the affected infants were the first child, 3 were the second child and 1 was the third child of the family. DDH was not found in other ranks. Distribution by age at time of diagnosis is as follow: 3 cases were diagnosed in the neonatal period; 3 cases at 1.5 months; 1 case at 3 months and 3 cases at 4.5 months. Swaddling was reported in 1 of the 10 confirmed cases. Positive family history was also reported in 1 of the 10 confirmed cases.

Discussion

During the course of our study, we found that 30% of the infants had received a early and correct diagnosis by clinical examination and confirmed by ultrasound examination. For the other 70% of infants, DDH had not been diagnosed until this study when their ages ranged from 1.5 to 4.5 months and when they were attending the outpatient clinics for vaccination. We selected outpatient clinics because they are exclusive centres for routine vaccination in the region. The age range 1.5–4.5 months was selected based on the Iranian timetable for children's vaccination at the time of study, easy availability and high coverage of infants.

Table 2 **Distribution of cases of developmental dysplasia of the hip by age at diagnosis**

Age at diagnosis	No.	%
Before 1.5 months of age	3	30
After 1.5 months of age	7	70
Total	10	100

Different policies now exist regarding the diagnosis of DDH; in Germany and Australia there is universal use of ultrasound while in Canada clinical screening alone is used [*7–9*]. A Turkish study reported that the sensitivity, specificity, positive predictive value and negative predictive values of having a history of DDH were 10.0%, 98.1%, 0.9%, 99.8% and of having abnormal hip examination findings were 100.0%, 88.9%, 1.6% and 100.0%. This study included breech presentation, family history of DDH and swaddling as known risk factors [*10*]. The results of our study concur with those of the Turkish study.

Depending on the screening method and available guidelines, even in a country with different local programme, DDH diagnosis rates differ [*11,12*]. In the study of Yiv et al., isolated DDH had a prevalence of 10.5/1000 births and 84% of cases were detected in the neonatal period [*13*]. Another study reported that the prevalence of DDH was 0.92%–1.14% in the neonatal period and 0.22% as late DDH [*9*]. It has been reported that 84% of cases were diagnosed during the early neonatal period whereas only 16% were detected in follow-up examination [*13,14*]. Comparing the above-mentioned results with our findings (70%), it is clear that in our region, late diagnosis is at least 3 times more frequent than the average of the reported studies.

Early diagnosis of DDH is an important marker for the evaluation of the diagnosis policy. Many countries periodically assess and, if necessary, change their programme for reducing late diagnosis [*15–17*]. From the results of our study, it is strongly recommended that guidelines and screening be devised for better and early diagnosis of DDH in our area.

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International Health Regulations (IHR)

A revision of the International Health Regulations, IHR(2005), was unanimously adopted by the World Health Assembly in May 2005, and these Regulations are scheduled to enter into force in June 2007.

The broadened purpose and scope of the IHR(2005) are to "prevent, protect against, control and provide a public health response to the international spread of disease and which avoid unnecessary interference with international traffic and trade."

The renewed mandate given to Member States and WHO under the IHR(2005) has also increased their respective roles and responsibilities. In particular, States Parties to the IHR(2005) are required to develop, strengthen and maintain core surveillance and response capacities to detect, assess, notify and report public health events to the World Health Organization (WHO) and respond to public health risks and public health emergencies. WHO, in turn, is to collaborate with States Parties to evaluate their public health capacities, facilitate technical cooperation, logistical support and the mobilization of financial resources for building capacity in surveillance and response.

The document is available in 6 languages, including Arabic, English and French.

Links to the revision can be accessed on this page: http://www.who.int/csr/ihr/en/index.html