

Evaluation of Developmental Delay in Infants Who Came in for 6th Month Vaccination in Isfahan City Health Centers

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Omid YAGHINI MD¹,
Farzaneh DANESH²,
Touran MAHMOUDIAN MD³,
Babak BEIGI MD⁴,
Shiva EBRAHIMIAN MSc⁵

1. Assistant Professor of Pediatric Neurology, Isfahan University of Medical Sciences, Isfahan, Iran
2. Medical Student, Isfahan University of Medical Sciences, Isfahan, Iran
3. Associate Professor of Pediatric Neurology, Isfahan University of Medical Sciences, Isfahan, Iran
4. Pediatrician, Isfahan, Iran
5. Instructor of Speech Therapy, Department of Speech Therapy, Shiraz University of Medical Sciences, Shiraz, Iran

Corresponding Author:
Danesh F.
Tel: +98 311 2645096
Fax: +98 311 6615528
Email: Fdanesh2005@yahoo.com

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Abstract

Objective

Developmental delay is one of the most common causes of conferring the pediatric neurologist. The main part of neurological growth and development occur in the first two years especially in the first 6 months of life. Metabolic or skeletal diseases are important causes of developmental delay. Early diagnosis of deviance from the normal diagram of development in lower ages is important.

Materials & Methods

Specific ages and stages questionnaires (ASQ) for 6 months was completed in the health centers for 800 infants conferring for their vaccination in Isfahan and the retest was performed at 24 months of age by ASQ and then these two questionnaires were compared.

Results

10.5% of the infants were delayed in at least one domain. At 24 months, 38.4% of them remained delayed; 21.1% in one domain, 9.6% in two domains, 3.8% in four domains and 3.8% in five domains. Of the children who had problem in communication, 20%; in gross motor, 25%; in fine motor, 20%; and in problem solving, 30% remained delayed. In the personal social domain, none of the delayed children at 6 months remained delayed at 24 months.

Conclusion

ASQ is feasible, inexpensive, easy to use and was appreciated by the parents. It can be used as a screening test for detection of developmental delay in lower ages, but its results must be followed by other standard tests or diagnostic tools.

Keywords: Developmental delay; Infants; Health centers

Introduction

Developmental delay is one of the most common causes of referring children to pediatric neurological clinics. In several studies which were performed in different countries, the prevalence of these disorders has been estimated as 10% (1,2).

Developmental delay includes two major groups: cerebral palsy and progressive brain disorders or neurodegenerative disorders. These diseases globally constitute developmental disorder in the child. Early diagnosis of patients with developmental delay especially cerebral palsy is important in four aspects:

- 1- Due to neuroplasticity, primary treatment is effective in the future prognosis.
- 2- Early interference prevents the severity of the disorder (2) and early diagnosis may prevent the incidence of skeletal deformity and contracture, behavioural disorder and other outcomes of brain disorders.

3-Earlier diagnosis of diseases leads to earlier corresponding of parents with rehabilitative team members and sooner use of rehabilitator guidance and other treatments.

4- Finally, side effects such as contracture and deformity do not appear in infancy; therefore, treatment will be accomplished in shorter time leading to lower costs for the family and therapeutic centers.

In addition to all of the named problems, the importance of earlier neurological exams in infants is clear. Because by early diagnosis of infants who are not on the normal developmental pathway, they will be treated earlier and it will be possible to prevent metabolic disorders to become more severe and on the other hand, the ASQ test approved and translated by the ministry of health and medical education of Iran will be used as a screening tool for Iranian children and we can use this test in upper levels for all newborns because ASQ is an inexpensive and sensitive method (2) and it may be used as a parent-completed screening test.

Some of the symptoms of developmental delay are not diagnosable by mothers and the family and even physicians. So it is possible to perform screening tests earlier than 6 months for detection of cases who are apparently normal. In our study, for better evaluation of the children, we used instructed questioners. Besides, our effort was to find these developmental disorders earlier and in lower ages. According to the above-mentioned conditions the best age this study is assessable is considered as 6 months. This study was a survey of the prevalence of developmental delay in infants who confer for their sixth month vaccination in Isfahan city.

Materials & Methods

This is a descriptive study that was carried out from May 2010 to May 2012 in health centers in Isfahan. The under study group were infants coming for their 6 month vaccination to health centers.

Scale of entrance

Infants who came to health centers for their 6-month vaccination.

Scale of exclusion

Incomplete personal data in the questionnaire such as phone number and infants who did not confer with the paediatric neurologist for follow up.

Method of sampling and sample volume

Based on the 10% prevalence of this disorder ($p=10\%$) and a 95% confidence factor ($z=1.96$) and a 0.02 accuracy rate ($d=0.02$), with this formula $n = \frac{z^2 p(1-p)}{d^2}$ the acquired sample volume was 865 cases. ASQ test was done for all the cases.

ASQ questionnaire includes five sub tests: communication, coarse motor activity, fine motor activity, language and social domains.

Data selection

ASQ is a questionnaire that can screen the developmental status of the children from 4 to 60 months in five different domains: communication, gross motor, fine motor, problem solving and personal social skills. Each domain is evaluated by six questions regarding what the child can or cannot do. They are selected as representatives of a developmental quotient of 75-100%. The parents' answer to each question is "yes" to indicate that the child does the specific behavior of this item (score, 10 points), "sometimes" to indicate an occasional or emerging response (score, 5 points) and "not yet" to indicate that their was no response (score, 0). Then, the scores of each item are summed and the final score in each domain is compared with cut-off points of the ASQ guidelines. The score on any domain below the cut-off point is considered abnormal and is referred for further evaluation (8 - 12).

Our questioners in health centers completed ASQ questionnaires for the infants who came for their 6-month vaccination and because almost always infants in this age confer for their vaccination, results of this study generate good prospect about the prevalence of these disorders among infants in this age group.

In this study, questions about 6 months and then questions about second age 24 months were asked. Then with the Z static test the prevalence of developmental delay globally and separately in each domain regarding gender were obtained. Infants who did not achieve a complete score in the ASQ test were evaluated again at 24 months with the ASQ test and some of them who did not get a complete score again, were followed. Some of them were house rested by a pediatric neurologist and others were recommended to confer a pediatric neurologist.

Ethics

We informed the parents that this is a research plan and we discussed the methodology. This study was ethically confirmed by the ethics committee of Isfahan University of Medical Sciences.

Results

In the present study, 800 six-month-old children (432 boys, 369 girls) were screened using the ASQ test. 10.5% of them (84 children) consisting 40 girls (10.8% of total girls) and 44 boys (10.2% of total boys) had scores lower than the cut off point in at least one of ASQ test domains. They were followed by ASQ test again at 24 months.

At 6 months, of these 84 children, 19.2% had problem in the communication domain, 30.7% in gross motor, 53.8% in fine motor, 26.9% in problem solving and 7.6% in personal social.

Of the 84 cases, 32 had no phone number or their phone number had changed or their parents did not respond. Therefore, 32 children were excluded from the study. Finally, 52 children (29 boys, 23 girls) were followed by the ASQ test at 24 months. Of these 52 children in the first screening test at 6 months, 69.2% had a problem in one domain, 23.2% in two domains and 7.6% in three domains.

In the retest at 24 months, 61.6% had no problem, 21.1% had problem in one domain, 9.6% in two domains, 3.8% in four domains and 3.8% in five domains. Actually of the 52 cases, 38.4% remained delayed in at least one domain.

According to Pearson's correlation test there is direct relationship between the number of problems in the first test at 6 months and the number of problems in the retest at 24 months.

Using Mc Nemar test, 9.5% of the cases, which were normal in the communication domain at 6 months became delayed at 24 months and 20% of the delayed children at 6 months remained delayed at 24 months. 5.5% of the cases that were normal in gross motor at 6 months became delayed at 24 months and 25% of the delayed children at 6 months, remained delayed at 24 months. 12.6% of the cases that were normal in fine motor at 6 months became delayed at 24 months and 20% of delayed children at 6 months remained delayed at 24 months. 20% of the cases, who were normal in

solving problem at 6 months, became delayed and 30% of delayed children at 6 months remained delayed at 24 months. 12.5% of normal children in personal social domain at 6 months became delayed and from those who were delayed at 6 months none were delayed at 24 months.

Discussion

Early detection and intervention of children with developmental delays or disorders is an important issue in pediatric medicine. Early detection and intervention in developmental problems can reduce their impact on the child's well-being (12).

In the present study, the prevalence of developmental delay among infants who confer for their 6 months vaccination was 10.5%, 10.8% in girls and 10.2% in boys, which was relatively consistent with the results of other studies performed in Iran. There were no relation between the prevalence of developmental delay and gender.

According to our study, children who had more problems in the first test had more problems in the retest. The problem of 70% of the children, who had one problem in the first test, was solved completely in the retest. In 50% of children with a problem in two domains in the first test, the problem was solved completely in the second test. Any of the children with a problem in three domains did not become problem-free in the retest.

A study in Tehran city showed that the prevalence of developmental delay among 4 to 60-month-old children was 18% using ASQ test (13), which was higher than our results. In other study in Tehran, the prevalence of developmental delay among 0 to 6-year-olds was evaluated as 12% using ASQ test and the evaluation by developmental pediatricians (14).

In a study in Canada it was shown that the sensitivity and specificity of ASQ test among the community were 100% and 90%, respectively (15).

In another study, the results of ASQ and BSID II (Bayley Scale of Infant development II) were compared and it was shown that their results in communication, personal social and gross motor domains were correlated, but there were no correlation between them in fine motor and problem solving (16).

In a study on 4 to 60-month-old children in Tehran, the

results of ASQ and PDQ (Prescreening Developmental Questionnaire) were compared and it was shown that the results were different (13).

In the present study, we found that ASQ is a feasible, easy to use and inexpensive test for developmental delay screening. Parents had good compliance even in the second test, which was done via telephone. We have to mention the fact that there were some problems with this method of screening, for example parents of child who had to be visited by a pediatric neurologist did not go to the clinic. Additionally, ASQ is not diagnostic and its results must be followed by more evaluations such as being visited by pediatricians.

ASQ seems to be an appropriate screening test.

In conclusion, ASQ is feasible, inexpensive, easy to use, and is appreciated by the parents (15). It can be used as a screening test for the detection of developmental delay in lower ages, but its results must be followed by other standard tests or diagnostic tools.

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