Parent's Evaluation of Developmental Status (PEDS) Detects Developmental Problems Compared to Denver II

Kanjana Theeranate MD*
Supichaya Chuengchitraks MD*,

** Division of Developmental Behavioral Pediatrics, Department of Pediatrics, Phramongkutklao College of Medicine, Bangkok, Thailand*

The early detection of developmental and behavioral problems in children is crucial for early intervention. The effectiveness of early detection depends on skills and interest of clinicians. Parents are the precious sources of information. The suspicions of parents about their children s development should be considered. The success of early identification is influenced by pediatricians who elicit, recognize, select clinical information and judge how to manage. The purpose of the present pilot study was to assess whether parents can be the sources of clinical information in detecting developmental problems of their children.

Parent's Evaluation of developmental status (PEDS) is used to elicit parents which is the useful and widely used tool for developmental screening by measuring the sensitivity and sensitivity of PEDS. The additional goal is to find the prevalence of developmental problems in this population.

Material and Method: *A total of 216 parent-child dyads, children 0-72 months of age, were recruited from the Pediatrics Outpatient Clinic and Child Health Supervision Clinic at Phramongkutklao Hospital from 1 July 2001 to 31 July 2002. Children who were chronically ill or had known developmental delay were excluded. Data regarding prenatal, perinatal and postnatal risk factors, health status, childrearing practice, parental education and family income were gathered. The Parents Evaluations of Developmental Status (PEDS) was completed by interview. The developmental screening test was administered by using Denver II. The authors compared the items of language, fine motor adaptive and gross motor skills.*

Statistical Analysis: *Descriptive statistic for demographic data was used and diagnostic test was performed in order to detect sensitivity and specificity. The Kappa was administered for analyzing the relationship between PEDS and Denver II*

Results: *Certain concern in developmental delay was 4.1 % and suspected Denver II was 3.24 %. Forty-two point five percent of the children who were suspected in Denver II were not concerned. Forty-seven percent of children who was concerned also failed in Denver II. Ninety-four percent of children had no concern and also had normal screening test. The sensitivity of PEDS was 57.14 percent, the specificity was 97.6 percent. The agreement of PEDS and Denver II was 0.43 (Kappa = 0.43).*

Conclusion: *PEDS could play a role in detection of developmental problems but was not a good tool in screening. Therefore, significant concerns of parents about their children s development are the critical information for referral to have further management. In other words, parents concerns could have far more advantage than the screening test.*

Keywords: *PEDS, Denver II*

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Parents are often concerned about their children. The issues concerned include medical, development and behaviors. Parents usually failed to raise their psychosocial concern, only 28% of parents indicated they had discussed or planned to present non medical concern to the pediatricians[1,2]. Pediatricians were

reluctant to respond to psychosocial concerns. Time consuming, inadequate training about psychosocial or uninterested in these issues could be the results[3].

Accurate early detection is a requisite to early intervention and its well-established benefits for children with disabilities and those at risk due to psychosocial disadvantage[4,5]. Accepted standards for screening test accuracy are sensitivity and specificity between 70% and 80%. Good quality screening tests should be used and adequate standard provided for developmental and behavioral care for pediatric practice. Unfortunately, in Thailand, a screening test such as Denver II is not routinely performed. Clinical judgment is widely used even evidence suggested that clinical judgment fails to detect the majority of children with disabilities[6,7].

In the USA, PEDS qualifies as a formal screening test and has sensitivity and specificity between 70% and 80%[8]. Moreover, it takes only 5 minutes to administer and simulates questions which are usually asked by pediatricians but in a standard manner.

The purpose of the present study was to assess whether parents can be the source of clinical information in detecting developmental problems of their children by using standard interviewing (PEDS). In other words, does PEDS reach the standard for a screening test?. The additional purpose is to give the prevalence of developmental problems by using a screening test.

Material and Method

The subjects were 216 parents and children 0-72 months of age recruited from the Pediatrics Outpatient Clinic and Child Health Supervision Clinic at Phramongkutklao Hospital from July 2001 to July 2002. Inclusion criteria: The parents of children who were available and were not seriously ill or chronically ill were asked to participate.

Exclusion criteria: Seriously ill, chronically ill or known developmental delayed children.

PEDS was translated into Thai by 3 pediatricians then the questionnaire was validated. The authors used the validated questions to interview the participants who were a sampling from every 10th patient and informed consent was completed.

Parents were administered the Parent s Evaluation of Developmental Status (PEDS) and questionnaire which has 2 parts of required demographic data and recall report of their children s development.

Children s development was screened by using Denver II a standard screening test. Pediatrician administered PEDS and Denver II, one conducted PEDS another screened the children s development.

PEDS has 10 questions eliciting parental concerns and 12 appropriate columns for the child s age. Shaded boxes are for the significant concern in each age group and un-shaded boxes are for non-significant concerns. Counting the total number of checks in the shaded boxes and determined the appropriate path to follow on the PEDS interpretation form. PEDS identifies when to refer, provide a second screen; counsel on monitor development, behavior and academic progress. The authors matched significant concerns of language, fine motor and gross motor skills to the same developmental areas of which caution and delayed items of Denver II which were defined as suspected.

Statistical Analysis

The diagnostic test was administered in order to assess whether the parent s concern about their children s development can be used as a screening test. Agreement of PEDS with Denver II was tested by Kappa statistic. Descriptive statistic was used for demographic data.

Results

All sampling parent child-dyads accepted to be recruited in the present study after being informed. There were 111 boys (51%) and 105 girls (49%). 3.24% of this population were suspected to have developmental problems screening by Denver II. Ninety-five percent were mainly from urban or suburban areas, 42% of the mothers were housewives. Ninety-seven percent were married and had a good marital relationship. Sixty percent had an education level of 9th grade or more. 42% of the mothers had a major role in taking care of their children, 30% were both mother and father and 28% were relatives who brought up the children (Table 1).

Forty-four percent of the children who failed the screening test had parents with concern about language, fine motor and gross motor skills. Ninety-four per cent of the children who passed the screening test had parents with no concerns.

The types of parental concerns did not vary significantly with education socioeconomic status, experiences, demographic and other characteristics did not seem to influence whether parental responses

Correspondence to: Theeranate K, Division of Developmental Behavioral Pediatrics, Department of Pediatrics, Phramongkutklao College of Medicine, Bangkok, Thailand.

Table 1. Demographic data (N=216)

	No.	Percent
Sex		
Boys	111	51
Girls	105	49
Neighborhoods		
urban, suburban	205	95
country	11	5
Marital status		
Married	210	97
Divorced	6	3
Caregivers		
Mothers	91	42
Mothers and fathers	65	30
Relatives	60	28
Maternal education:>9 yrs	130	60
Income<฿240,000/year	112	52

Table 2. Maternal and child health status (N=216)

	No.	Percent
Maternal prenatal illness	10	4.6
Maternal prenatal complication	6	2.8
Preterm delivery	12	5.6
Postnatal complication	28	13.0

Table 3. Postnatal complication (N=216)

	No.	Percent
Oxygen required	6	2.8
Hyperbilirubinemia	19	8.8
Polycythemia	1	0.5
Hyperglycemia	2	0.9

Table 4. Age of participants

Age range	No. (Total=216)	Percent
0-12 month	108	50
>12-24 month	52	24
>24-36 month	26	12
>30-48 month	12	6
>46-60 month	12	6
>60-72 month	6	2

Table 5. Predictive utility of PEDS compare to Denver II

PEDS	Suspected	Normal	Total
Positive	4	5	9
Negative	3	204	207
N	7	209	216

Sensitivity = (4/7) 100 = 57.4%
Specificity = (204/209) 100 = 97.6%

corresponded to screening test performance.
Table 2 shows that 4.6% of the mothers had medical problems during pregnancy, 2.8 % had prenatal problems, preterm delivery was 5.6 % and there was postnatal complications (Table 3).

Table 4 shows that the age of the subjects categorized follow to PEDS, 50% of the children were infancts, 36% were toddlers and 14% were at preschooler.

Certain concerns were highly related to developmental outcome which were language, fine motor and gross motor skills. Presence of significant parental concerns was intersected with failed Denver II but no significant concerns. Five children who had significant concern but passed Denver II were all first born children (Table 5).

Discussion

The number of children who were suspected to have developmental delay was 3.24% consistent with the findings of Kochabhakdi NJ. et al.[10].

The success of early identification of children with developmental and behavioral problems is influenced by the manner in which pediatricians elicit, recognize and select clinical information and derive appropriate impression[11]. Current pediatric practice in order to monitor children s development and behavior include reviewing milestones with parents, rely on clinical judgment based on history and performing formal screening with standardized test[11,12].

In Thailand, pediatrician s infrequent use of development and behavioral screening test is similar to past research[13-17]. Thai Pediatricians usually rely on subjective impression. Estimation of children s development and behavioral problem are often inaccurate[6,15-18]. Furthermore, pediatricians have under identification of children with developmental and behavioral problems.

The use of information from parents is routinely used even in a standardized test such as

Denver II. Similarly, pediatricians often request parent s information of development. Since the parental knowledge of development is limited, they cannot identify the typical age at which children achieve milestones.

Compared to Glascoe et al., which has sensitivity and specificity of 70% and 80%. Compared to the diagnostic test. In the present study, PEDS was compared to Denver II which is a screening test. However, PEDS has a specificity of 97.6 %. But a sensitivity of only 57.4% implied that PEDS can be used as a tool to determine developmental problems.

Moreover, the advantages of PEDS are less time consuming,and simulates questions already routinely asked by pediatricians. PEDS also guides when to refer, to use a second screening test, so PEDS provides a systematic developmental surveillance, triage and health promotion. It serves pediatricians to make an effective effort for children s developmental and behavioral needs.

Conclusion

Since the agreement of PEDS with Denver II was not statistically significant. Additional research is needed to confirm and extend these findings, including test validate with a large and more stratified population.

The data showed that young parents with their first born had concerns about their children but passed the screening test. This can be explained by lacking of experience. The majority of the population were infants which is difficult for parents to identify developmental problems or have concern about them.

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ความสอดคล้องของการประเมินพัฒนาการโดยบิดามารดา โดยใช้แบบสอบถาม PEDS เทียบกับการประเมินพัฒนาการโดยใช้ Denver II

กัญจนา ธีรเนตร, สุพิชญา จึงจิตรักษ์,

บทนำ: *การสืบค้นเด็กที่มีปัญหาพัฒนาการและพฤติกรรมมีความสำคัญอย่างยิ่งต่อการส่งเสริมพัฒนาการตั้งแต่แรก ประสิทธิภาพของการค้นพบปัญหาขึ้นกับทักษะและความสนใจของแพทย์ที่จะหาข้อมูล ความสงสัยของบิดามารดาจึงควรได้รับความสนใจ*

วัตถุประสงค์: *จุดมุ่งหมายของการศึกษานำร่องนี้เพื่อที่จะประเมินความเที่ยงตรงของข้อมูลที่ได้รับจากบิดามารดาเมื่อสงสัยว่าลูกมีปัญหาพัฒนาการโดยใช้แบบสอบถามบิดามารดาในการสังเกตพัฒนาการและพฤติกรรมของบุตร (PEDS) เทียบกับ Denver II ซึ่งเป็นแบบคัดกรองพัฒนาการที่ใช้อย่างแพร่หลาย จุดประสงค์รอง เพื่อหาความชุกของปัญหาพัฒนาการในกลุ่มเป้าหมาย*

วัสดุและวิธีการ: *ศึกษาในผู้ปกครองที่พาบุตรหลานมาตรวจที่แผนกตรวจโรคผู้ป่วยนอกกองกุมารเวชกรรม โรงพยาบาลพระมงกุฎเกล้า ตั้งแต่วันที่ 1 กรกฎาคม พ.ศ. 2544 - 31 กรกฎาคม พ.ศ. 2544 จำนวน 216 คน โดยมีอายุอยู่ระหว่าง 0-72 เดือน เด็กที่มีปัญหาเจ็บป่วยเรื้อรังหรือผู้ป่วยที่ทราบอยู่แล้วว่าพัฒนาการล่าช้า จะถูกคัดออกจากการศึกษา ใช้แบบสอบถาม PEDS ถามผู้ปกครองที่พาเด็กมาตรวจ จากนั้นประเมินพัฒนาการ โดยใช้ Denver II เปรียบเทียบเฉพาะพัฒนาการทางภาษา การใช้ตาและมือในการแก้ปัญหา และพัฒนาการด้านการทรงตัว และเคลื่อนไหว*

การวิเคราะห์ทางสถิติ: *ใช้สถิติเชิงพรรณนา สำหรับข้อมูลทั่วไป Diagnostic test เพื่อหาความไวและความจำเฉพาะของแบบสอบถาม (Sensitivity, specificity ตามลำดับ) ใช้ kappa ในการหาค่าความสอดคล้องของ PEDS เทียบกับ Denver II*

ผลการศึกษา: *พบความสงสัยห่วงใยของผู้ปกครองเกี่ยวกับพัฒนาการของบุตรหลานร้อยละ 4.1 แต่จากการประเมินพัฒนาการโดยใช้ Denver II พบสงสัยว่ามีปัญหา (suspicious) ร้อยละ 3.24 และร้อยละ 42.5 ตรวจพบว่าสงสัยว่ามีปัญหา (suspicious) จาก Denver II แต่ผู้ปกครองไม่มีความสงสัยห่วงใยร้อยละ 47 และร้อยละ 94 ผู้ปกครองไม่มีความสงสัยห่วงใยพัฒนาการ และจากการประเมินพัฒนาการพบว่าอยู่ในเกณฑ์ปกติ ดังนั้นความไวของ PEDS = ร้อยละ 57.14, ความจำเพาะ = ร้อยละ 97.6 ความสอดคล้อง PEDS และ Denver II = 0.43*

สรุป: *แบบสอบถามพัฒนาการและพฤติกรรมโดยบิดามารดา ยังมีความไวไม่ดีพอที่จะนำมาใช้เป็นแบบตรวจคัดกรองภาวะพัฒนาการล่าช้าซึ่งสัมพันธ์กับความสอดคล้องเปรียบเทียบกับการตรวจพัฒนาการด้วย Denver II แต่มีค่าความจำเพาะของแบบทดสอบสูง ควรทำการทดสอบเพิ่มเติมโดยเพิ่มจำนวนผู้เข้าวิจัย เพื่อเพิ่มความเชื่อถือของความไวของแบบสอบถาม*