

Children with Poor School Performance for Specific Learning Disability

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Abstract

Background: Poor performance of school children has always been a cause of concern. Some students, grasping power may be very poor, some others may speak very slowly and many others may be confused with signs and make careless mistakes. Teachers and parents may know that the child is different, but may not be able to give the reason. Little do they realize that the child is suffering from learning difficulty, which is related to brain development that causes hyperactivity, impulsive behavior, and attention problems. The aim of this study is to identify learning disability in children with poor school performance and to analyze their clinical profile.

Materials and Methods: This is a cross-sectional study over a period of 1-year from July 2013 to June 2014 conducted at Kannur Medical College, Anjarakandy, a total 300 students with poor school performance were selected by their class teacher. To the parents of these children, a questionnaire was given regarding birth history, development history, and questions regarding warning signs of learning disability. The students were later assessed.

Results: Out of the 300 students with poor school performance, parental perception of learning problems was seen in 106 students. Post assessment 39 (13%) students had learning disability. Association was found between low birth weight, preterm birth, language, social and motor developmental delay. Association was also found between learning disability and attention deficit hyperactivity disorder.

Conclusion: Learning disability was identified in a significant number of students. Screening children for learning disability should be there at the kindergarten level so that children can be identified and remedial measures initiated.

Key words: Learning disability, Performance, School

INTRODUCTION

School education is socially and culturally valuable in our world. Good school performance is an indication of future social success. At least one in five students has trouble keeping up academically at some point during school. In recent years, complaints of poor school performance and difficulty in learning have increased in doctor's office.

Poor school performance should be seen as a symptom related to many etiologies. It can be environmental or

individual factors. One of distressed due to persistent failures. Such children require our immediate attention before a youngster develops an aversion to attending school. The aim of this study was to identify learning disability in children with poor school performance and to analyze their clinical profile.

MATERIALS AND METHODS

The study group included children in the age group of 8-12 years studying in third to seventh grade. The study was conducted between July 2013 and June 2014 for 1 year. Students with poor school performance were selected by their class teacher based on their academic and overall performance. Schools included in the study were located in Kannur Medical College, Anjarakandy and rural areas of Kannur district in Kerala state, India. The sample size was 300 students with poor school performance. Consent

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was obtained from the school principal and parents. The study was approved by the Ethical and Research Committee of Our Institute.

For the children included in the study, a questionnaire was given regarding birth history, pre and postnatal events, developmental history, history of any significant medical illness, family history, socio-economic history, question regarding warning signs of learning disability and features of attention deficit hyperactivity disorder (ADHD). The questionnaire was administered in the local language (Malayalam). The questionnaire was piloted before finalization. Back translation was also done. When feasible the interview was directly conducted with the parent and teacher.

A gross assessment of intellectual ability and the individual factor is learning disability. Learning disability is related to problems of acquisition and development of brain function involved in learning such as dyslexia, dyscalculia, and writing disorder. Without recognition and help children with a learning disability become increasingly frustrated and visual motor skills were done using "Good enough Harris draw a man test."¹ A general physical examination was carried out with a notice on dysmorphic features and neurocutaneous markers. Neurological examination was done to look for fine motor abnormalities and soft neurological signs. The audiometric and ophthalmic examination was done to rule out hearing and visual deficits. For school based assessment, Snellen's six-meter test was used for vision. For hearing Rinne and Weber test was done. Assessment of reading, writing, and maths was done by informal method.²

Reading Assessment (Shankarnarayan and Kagan)³

- 1) Letter identification (Children were asked to identify letters of English alphabet presented in upper case and lower case in random order)
- 2) Word recognition (Children were asked to read a list of words)
- 3) Reading text 1 and text 2 (Children were asked to read two texts).

Writing Assessment

Checklist for writing assessment.

No space between words, reverses letters/words, omits letters, add letters, poor punctuation, no or wrong capital letters, poor letter formations, poor slanting, messy, too many cancellations, line quality, holding pen, and placement of paper.

Mathematical Ability

Ability to write the numbers in sequence, ability to do addition, subtraction, multiplication, and division, as

appropriate for age. Children with low IQ for age as assessed by Draw a man test, children with vision/hearing problem were not included for assessment of learning disability.

The diagnosis of co-occurring ADHD was made by ascertaining that the child's specific behavior is meeting the DSM-IV revised criteria.

Data were analyzed using SPSS software version 22; Chi-square test was used to find out the association between various factors and learning disability. $P < 0.05$ was considered statistically significant.

RESULTS

In this study, 300 students with poor school performance, in the age group of 8-12 years were included. From the questionnaire provided to the parents of these children, parental perception of learning problems was seen in 106 students. Out of this, 19 children were excluded from the assessment of learning disability because of poor vision, hearing problems, and lack of intellectual ability by draw a man test. Post assessment learning disability was found in 39 students. Considering clinical profile of these 39 students, 82.05% were boys and 7.18% girls. The majority were 10 years of age. 48.72% belonged to upper middle class; 15.38% belonged to lower middle class, and 5.13% belonged to upper class (modified Kuppaswamy's scale).⁴

Coming to types of learning disability, the majority had difficulty in reading and writing. That is 30.77%. 10.26% had difficulty in reading, writing, and maths. 8.2% had difficulty in reading only. 7.18% had difficulty in writing only, and 2.5% had difficulty in maths.

Children with learning difficulty were compared with other children who were poor in school performance. The following Tables 1-3 shows the parental perception of children with difficulty in reading, language writing, and maths, ($P < 0.05$).

Coming to other associations in the learning disabled group, the following things were found to be statistically significant:

Low birth weight ($P = 0.0085$); pre-term birth ($P = 0.032$); motor developmental delay ($P = 0.0457$); language delay ($P = 0.0002$); and social development ($P = 0.0001$).

Association with ADHD was also found to be statistically significant in the learning disabled group ($P = 0.0067$) neurologi finger agnosia. The association of fine motor abnormality was statistically significant ($P = 0.0001$) in the group with learning disability.

Table 1: Reading and language difficulty (n=106)

Reading and language	No. of children	Learning disability	No learning disability	P value
Dislikes and avoids reading or reads reluctantly	71	33	38	0.003
Has difficulty retelling what has just been said	18	9	9	0.202
Has limited vocabulary	18	7	11	0.839
Demonstrates slow and halting speech	17	8	9	0.338
Uses poor grammar or misuses words in conversation	20	10	10	0.174
Mispronounces words frequently	22	10	12	0.344
Confuses words with others that sounds similar	34	15	19	0.283
Confuses words with others that sounds similar	34	15	19	0.283
Frequently skips paragraphs while reading	38	21	17	0.003
Reverses letter order in words	37	23	14	0.000
Reads slowly	65	34	31	0.000
Has difficulty rhyming	31	16	15	0.069
Confuses similar looking words	31	18	13	0.003
Substitutes or leaves out words while reading	53	26	27	0.008

Table 2: Writing difficulty (n=106)

Writing	Total no. of children	Learning disability present	No learning disability	P value
Writing is messy and incomplete	64	38	26	0.000
Uses uneven spacing between letters and words	53	33	20	0.000
Confuses similar looking letters and numbers	31	18	13	0.004
Grasps pencil awkwardly resulting in poor handwriting	38	25	13	0.000
Dislikes and avoids writing and drawing	44	28	16	0.000

Table 3: Difficulty in math (n=106)

Mathematics	Total no. of children	Learning disability	No learning disability	P value
Difficulty in mastering number knowledge	48	20	28	0.344
Difficulty with learning, basic addition, subtraction, multiplication, and division	57	27	30	0.025
Poorly aligns numbers resulting in computational error	51	28	23	0.000
Has trouble telling time	31	17	14	0.013
Has difficulty counting rapidly or making calculations	61	33	28	0.000

DISCUSSION

Specific learning disabilities are encountered commonly in the school setting in recent years major progress in the understanding of these learning problems has been made. The genetic backgrounds are being unraveled, with advanced neuroimaging techniques, the neurophysiologic mechanism of normal and call abnormalities noted were: Fine motor incoordination, the right to left confusion and abnormal learning are studied. For many parents, pediatrician is becoming their first line of advice.

A necessary framework has been provided by Frith⁵ to work up these cases. The first level is the behavioral level at which the everyday school problems of the child are situated. Here, the school problems are described in detail, problems with math, attention problems, reading problems, copying problems, and so forth. In clinical practice, this is the most important level. Because it is at this level that

intervention should be started and followed. This study has used level one for work up.

About 300 was the total number of children with poor school performance. From the questionnaire provided, parental perception of learning problems was seen in 106 students, i.e., in 35.33% Karande *et al.*⁶ investigated parental knowledge of specific learning disability and evaluated the impact of educational intervention on it. They concluded that parental knowledge of their child's learning disability is inadequate, and this can be improved by the single session education program. A supportive home is one of the factors that can favorably determine the outcome of specific learning disability.

Post assessment 39, i.e., 13% had the learning disability. The occurrence of learning disabilities has been estimated differently in the different countries of the world. The "real" prevalence of learning disability is subject to much

dispute because of the lack of an agreed-on definition of learning disability with objective identification criteria.

A study conducted by Mogasale *et al.*⁷ in South Indian city to measure the prevalence of specific learning disability shows a prevalence of 15.17%.

The lifetime prevalence of learning disabilities in US children is reported to be 9.7%.⁸ Thus, studies conducted for the prevalence of specific learning disability shows variable results.

The present study compared the incidence of learning disabilities in males and females. Schools identified more numbers of males with poor school performance - 259 boys and 41 girls. This could be because boys more often come to attention as a result of disruptive behavioral pattern, and girls often go unnoticed. Our study identified 32 (82.05%) boys and 7 (17.95%) girls with learning disability. The gender difference in learning disabilities has been a subject of debate from a long time.

Shaywitz *et al.*⁹ showed that there was no significant difference in the prevalence of reading disability in research identified girls. They indicated that school identified samples were almost unavoidably subject to a referral bias.

Age group selected was 8-12 years.¹⁰ A conclusive diagnosis of specific learning disabilities should not be made until the child is in the third grade or about 7-8 years old as some children are "normal late developers," and they on their own outgrow their learning problems.

Coming to the socio-economic status, the majority came from upper and lower middle class were 19 (48.72%) and 15 (38.46%), respectively. A study done by Karande *et al.*¹¹ showed that majority came from upper middle class. The poor socio-cultural home environment is one of the causes for children to underperforming but cannot result in learning disability.

Learning problems of children can be classified as dyslexia, dyscalculia after they are analyzed with appropriate neuropsychological test batteries. That is level two of Frith's framework.⁵ This vision also prevents doctors from writing attestation, solely based on their clinical opinion. In this study, the majority 12 (30.72%) had difficulty in reading and writing; 10 (25.64%) children had difficulty in reading, writing, and mathematics; 8 (20.51%) had difficulty in reading only, and 7 (17.95%) and 2 (5.13%) had difficulty in writing and math, respectively.

Study on clinical characteristics of children with learning disorders in Taiwan by Huang *et al.*¹² showed

that percentages of subjects with reading disorders, mathematics disorder, and disorders of written expression only were 11.11%, 7.41%, and 25.93%, respectively. Majority 51.85% had both reading disorders and disorder of written expression.

The questionnaire given to understand the parental perception of learning problems in their children was prepared with questions which commonly children encounter with reading, writing, and math. Problems found to be statistically significant among students detected to have the learning disability is given in Tables 1-3. These can be included in the checklist when screening for learning problems.

Looking into the causal factors of learning disabilities, family history is considered as one of the risk factors. Half of the siblings of dyslexic individuals and half of the parents of dyslexics may have the disorder.¹³ In our study, no one came with a positive history of learning disability. This must be due to lack of awareness. Meister *et al.*¹⁴ in their analysis of 69 children showed that 28 (42%) had a family history of learning disability.

It is known that perinatal complications are associated with an increased prevalence of specific learning disability.¹³ In our study, 4 (10.26%) had antenatal insult, $P = 0.0792$, statistically not significant⁴ and had NICU admission, $P = 0.1147$, statistically not significant. 8 (20.5%) had low birth weight. An extensive screening of children for learning disability conducted by SCIMST,¹⁴ Thiruvananthapuram, showed that children with learning disabilities had the following associations, maternal illness (22.93%), prenatal drug intake (25.68%), birth asphyxia (15.59%), prematurity (5.59%), low birth weight (19.26%), and neonatal seizures (7.33%).

In our study, 5 (12.82%) had motor developmental delay; 12 (30.77%) had language developmental delay, and 11 (28.21%) had social developmental delay. In a study conducted by Karande *et al.*¹¹ had 12 (24%) and 11 (22%) children with delayed walking and delayed talking, respectively. A parental history frequently identifies early subtle language difficulties in dyslexic children. Both prospective and retrospective longitudinal studies indicate that dyslexia is a persistent chronic condition rather than transient development delay.

In this study, 7 (17.95%) had a history consistent with ADHD, which was statistically significant. Meister *et al.*¹⁴ in their analysis of 69 children with learning disability showed that 39.1% of the students had attention deficits. Comorbidity is an important consideration in the assessment of treatment of children with developmental

disabilities. It is important to assess for both disorders in any child and to develop a treatment plan that addresses both disorders when necessary.

The present study sought to identify neurological abnormalities in children with learning disabilities. Neurological abnormalities found were the fine motor incoordination, right to left disorientation, and finger agnosia. Among these, the fine motor in coordination was found to be statistically significant. Johnston *et al.*¹⁵ in their study on the neurological status of language impaired and normal children found that language impaired group was distinguished by less efficient performance in a number of areas, involving the rate of movement and left to right identification. Poor fine motor coordination, mirror movement, right-left disorientation and finger agnosia may occur in otherwise normal children, but these signs occur more often in children with learning or behavior problems.

CONCLUSION

About 13% of children had the learning disability in this study. It was more common in boys. Low birth weight and preterm birth were identified as causal factors. A significant association was found between learning disabilities and developmental delay, fine motor abnormalities, and ADHD.

Children who experienced difficulty in reading, writing, or working with numbers are labeled as lazy, obstinate, dumb and just not interested in studies. Early identification, initiation of appropriate psychoeducational interventions will help these children achieve school grades at a level that is commensurate with their intelligence. This would help prevent not only poor school performance, class retention, and development of behavioral problems

in childhood but also help these children develop into well-adjusted adults.

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