Learning Disability and Some Concurrent Factors : An Exploratory study

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A comprehensive and specific definition of learning disability (LD) has been elusive inspite of extensive research done in the field. Many definitions suggest that learning disability refers to a retardation, disorder, a delayed development in any one and more processes of speech, language, reading, writing, spelling, arithmetic; attention, reasoning, memory and social competence. According toALCD (1989), Boone (1987), Hamill (1990) Myklebust (1983). According to Myklebust (1983) these deficits may be due to a variety of endogenous, exogenous, congenital or acquired factors. According to Hamill (1990) it could be due to CNS dysfuncion and intrinsic to the individual.

Learning disability is different from a difficulty in learning due to a visual, hearing and motor handicap, mental retardation and emotional disturbances. Though problems in self regulatory behaviors, social perception, and social intraction may co-exist with learning disability they do not by themselves constitute learning disability. In lieu of the prevailing trend in literature, a total conceptualization of the disability is still remote due to the coexistence of several mutually influencing factors which may be contributing or precipitatory to learning disability.

Aim of the study :

This study is undertaken as an attempt to understand the specific nature of learning disability in the Indian context. It was aimed at identifying and analysing the causative factors, and/or contributory factors and characteristic features of the learning disabled and comparing the findings and correlating them with the trend in existing literature.

Methodology:

Thirty cases identified as LD in Al ISH between June 1988 and August 1993 were analysed in this study. The personal history of the subjects like age, sex, mother tongue and socio economic status was noted. The next criterion considered was the family, birth, and developmental history. The lapses in the cognitive skills that probable contributed to LD were tested for these cases, subsequent to which the characteristic features of these cases were analysed for their emotional adjustment, speech characteristics, language proficiency, problems faced in the classroom, reading and writing skills. Evaluation was done mainly in their own medium of instruction in school viz English and very few children were evaluated in their mother tongue.

Findings and discussion :

Subjects : The analysis of the subject characteristics revealed that the children reported with LD ranged from 6-16 years of age and hailed from middle socio-economic group. In India a majority of children in this group enter school at the age of six and it is generally only by the age of eleven or twelve years that any abnormality is brought to the notice of the parents. Therefore it is only natural that the maximum number of cases identified were within 6-12 years while between those between 12-16 years constituted only 17%. This correlates with the studies of Rama (1992). In our study there were 20 males and 10

females at the ratio of 67% to 33% with the disability. This correlates with the studies of Critchley (1968) who posited a ratio of 4 males to a female. Brain (1970) and Goldberg (1983) cited early anatomical maturation and mental maturation in females, lack of motivation and basic awareness regarding the problem in boys to be the causes for the sex differences.

AIISH being a referral institute for speech and hearing disabilities, the subjects constituted 20 Kannada speakers and 10 with other languages as mothertongues as Telugu, Tamil, Malayalam, Punjabi, Gujarathi etc.

Table -1 Subjects's Description

Age Range	Number (%)	Sex		Socioeconomic Status		Mother Tongue	
		Males	Female	<2000/m	>2000/m	Kan	Non Kan
6-8 Yrs	9(30)	6	3	3	6	6	3
8-10 Yrs	7(23)	5	2	3	4	4	3
10-12 Yrs	9(30)	5	4	3	6	6	3
12-14Yrs	2(6)	2	0	2	0	1	1
14-16Yrs	3(10)	2	1	3	0	3	0
Total		20	10	14	16	20	10
Percentage		66%	33%	47%	5%	66%	33%

Significant History

Family history :

Of the 30 children evaluated, only 7(23%) had positive family history, where either parent or the sibling suffered from related language disorders. Of the 7, two pairs of siblings suffered from LD while others had delayed language disorders in the family.

Table 2 reveals the relevant details. Consanguinity was found in 4(13%) of the 30 cases which was considered insignificant.

Prenatal and Birth Complications

The prevalence of prenatal birth complications was observed in 6(20%) out of 30. Details are elucidated in Table 2. While no definite tie has been established between any of these conditions and LD, in most, these conditions are identified as potential hazards for CNS functioning.

Developmental Milestones :

The motor milestones under consideration were, achievement of neck control, crawling, sitting etc. As reported by the informants, delay was seen in 2 of the 30 cases. Delay in onset of speech was seen in 15 cases of the 30.

Formal Test of Neurological Involvement:

According to the case files only 11 out of the 30 were tested for quick neurological screening test and BGT, Surprisingly all 11 were found to fall under the suspicious category of QNST with poor co-ordination. On the other hand based on the informal evaluation of all the 30 cases, soft neurological signs were observed in 20 (67%) see table 2 for details.

All the above findings of family history, prenatal birth hazards, formal organanicity evaluation etc, point directly or indirectly towards a possibility of neurological involvement.

Table 2 : Family, Birth and developmental history

Complication	Present	Absent
Birth history complications	6(20%)	24(80)
forcep delivery	2	
premature birth	1	
anemic mother	1	
cesarian delivery	1	
mother under medication	1	
Post natal complication.	15(50%)	15
Jaundice	3	
Anoxia	2	
Measles	4	
Epilepsy	3	
Chicken pox	3	
Meningitis	1	
Rickets	1	
Injury to the head	3	
Family history	7(23%)	23
learning disability	4	
delayed language	2	
stuttering	1	
Neurological signs	20(67%)	
clumsiness	13	10
Poor hand co-ordination	1	
difficulty in attending to environmental stimulation	8	

Support for genetic existence came from Matlinger (1941) who studied 285 dyslexics and found the presence of dyslexia in 95 cases (33%). Kawi and Pasamanik (1958) found that 16.6% of the dyslexic had gestational complications. Towbin (1971) demonstrated cerebral and cortical damage in children who had varying degrees of hypoxia, which is supposed to cause CNS dysfunction thereby resulting in learning disability. EEG studies by Rosenthal (1982), brain electrical activity mapping by Duffy (1981) and post mortem studies by Prozzolo and Hansch (1982), showed the presence of lesions in the planum temporale. Interestingly these studies were performed on dyslexics with no evidence of brain damage.

Cognitive skills :

General intelligence:

Information regarding the intelligence level of the 30 subjects was elicited from the clinical psychologists impression from the case records. Accordingly there were 12 (40%) subjects who fell under the poor intelligence category. Of them mild M.R. was diagnosed in 7 cases

and borderline intelligence in 5. The remaining 18 of 30 were in the normal intelligence category.

Intelligence tests :

Intelligence test WISC was performed on only 12 of the cases. This was because not all of the 30 children went to the Psychology department with a complaint of scholastic backwardness. They were categorised under "poor" or "average" intelligence depending upon whether they had an IQ score of below 70 or above 70 respectively. Accordingly 2(16%) had IQ below 70 and 10 (84%) and had IQ above 70.

Memory skills:

Information regarding memory relied on the informants only and poor memory was reported in 24(80%) of the 30 cases.

Visual discrimination :

Information regarding visual discrimination for the 30 cases was based on evaluation done by the clinician using the phoneme-grapheme correspondence test. Accordingly they were classified under poor discrimination and fair discrimination ; 50% of the children had a poor visual discrimination. See Table 3.

Table 3: Cognitive skills

Measures	Poor	Average
General intelligence	12	18(60%)
Intelligence test WISC (n = 12)	2	10(84%)
Memory skills	24	6
Visual discrimination	15(50%)	15
Auditory discrimination	17(57%)	13

Auditory discrimination :

The 30 cases were evaluated by the clinician based on dictation tests and word discrimination tests and classified under "average and poor".

From Critchley (1978) and Goldberg and Schiffman (1983) it is evident that cognitive skills such as auditory discrimination and visual discrimination need not necessarily be grossly impaired to cause learning disability but a minor impairment might exaggerate the handicap of learning. This evidence has been supported in this study also. The intelligence tests, however, do not confirm the correlation of intelligence with learning disability. According to Critchley (1978) children with IQ over 85 also showed low achievement in reading and writing ability, which was seen in our study also. Stanley (1973) has stressed the impairment or dysfunction in retrieval from short/iong term memory causing retardation in reading and writing abilities.

Emotional Adjustment:

Emotional instabilities of various natures ranging from mild to extreme were found in almost all 30 children. See table 4, for details. While sensitiveness, inferiority complex and temper tantrums were examples of emotional stabilities or immatuirities in the children, distractivity and hyperactivity indicated a characteristic sign of learning disability which were associated with attention deficits.

Literature review in this aspect emphasises the role played by emotional adjustment co-existing with learning disability. Pearson & English (1970) and Kirk (1967) showed that maladjustment may be due to unpleasant experiences and inadequate motivation. Goldberg (1983) attributed it to behavior rivalry and aggressive parenthood.

Table 4 : Emotional Adjustment

	Difficulty Exhibited	Difficulty Not exhibited
Tempertanturms	6	24
Self injurious Behaviour	2	28
Distractiveness	12	18
Overactive / Hyperactive	7	23
Social isolation	5	25
Sensitive	11	19
Fears failure	11	19

Speech and Language Characteristics :

Speech Characteristics :

Out of 30 cases 17 (56%) showed problem in articulation, 5(16%) showed stuttering and 2 (6%) showed voice problems and hoarseness. See table 5 for details.

Table 5 : Speech Characteristics :

	Difficulty Present	Difficulty Absent
Articulation	17	13
Voice	2	28
Stuttering	5	25

Saunders (1978) and Kajen (1943) also noticed stuttering, misarticulation and problems of voice in the dyslexic children. This finding raises doubts whether learning disability leads to articulatory/Fluency disorders or the articulatory/Fluency disorders contribute to the learning problems, which is yet to be established.

Language Exposure :

Apart from the mother tongue the other language to which the children were exposed to, were also

considered. See table 6 for details. It had been found that dyslexia occurred maximally in children with bilingual exposure or multilingual exposure where one of the languages was English. The fact that Indian languages have syllabic script (and English language is phonetic) was speculated to play a greater role in the cause of disorders. However literature regarding bilingualism is equivocal with different schools of thought [Critchley (1978) and Goldberg (1983)].

In general as reported by the parents, the subjects had a fairly good comprehension and expression. They reportedly had a poor vocabulary while writing which is supported by Critchley (1978) who stated that the written work of a dyslexic displays evidence of a limited vocabulary.

Classroom adjustment:

Based on a checklist, the problem faced by these children in the classroom are summerized in Table (7) 25(83%) faced difficulty in carrying out oral instructions. This was contradictory to the number of children who had poor auditory discrimination. It was hence evident that good auditory discrimination was not the only factor for the child to carry out oral instructions. Prevalence of attention deficit or disordered cognitive processing were also hypothesised. 24(80%)of the cases had difficulty in carrying out multiple commands. This could be an indication of soft neurological signs as the child was unable to comprehend and execute more than 2 commands at a time or due to inadequate recall memory or due to language processing difficulties. All the 30 children were too slow to finish work. This was probable because they were aware of their handicap and also because their processing was to slow. 18(60%) had difficulty in copying from the blackboard. This again was contradictory to their visual discrimination score mentioned earlier thereby indicating existence of supplementary factors such as attention deficit and disturbed cognitive processing. All of the 30 children tried to avoid reading mainly because of anxiety and stress enforced upon them. To escape this situation they would try to escape reading with any possible excuse as reported by informants. All the 30 children showed continued failure after repeated instructions. This can only be attributed to certain cognitive deficits in processing as intelligence and discrimination was in the normal range. 23 (76%) of the cases were reported to have repeated atleast 1 year due to their inability to cope up with the remaining students in the class.

Table 7 : Problems faced in the classroom

	Difficulty Present	Difficulty Absent
Difficulty in carrying our oral instruction	25 (83%)	5
Difficulty in carrying out multiple commands	24 (80%)	6
Too slow to finish work	30(100%)	0
Difficult in copying from board	18(60%)	12
Tries to avoid reading	30(100%)	0
Continued failure after repeated instructions	30(100%)	0
Failure in Class	23 (76%)	7

Reading Skills :

The reading skills of the 30 children were informally evaluated after being made to read passages and typical errors as shown were observed.

Informal evaluation	Difficulty Observed in
Spellings	
ex: big - dig	29
sing - sting	
Words	
ex: Through - though	30
Solicit - Solicilsts	
Aboard - Abroad	

Formal Testing in English	Test performed on	Poor (failed level II)	Fair (passed level II - III)
Oral reading readiness	18	15(83%)	3(17%)
Phoneme-grapheme Correspondence	13	8(62%)	6(38%)
Test Structural Analysis test	15	10(67%)	5(33%)

These findings have been supported by Boder (1973) Johnson and Hook (1978), Crichtley (1968), Thomsun (1984) who report of characteristic reading disturbances. Though exact reference correlating to the formal tests have not been cited in literature; the importance of these tests have been exphasized by Snowling (1986), Myklebust (1983), Rourke (1978) Thomson (1984).

Writing skills:

Writing skills were evaluated for the 30 cases and all of them showed difficulty in writing spontaneously. Surprisingly 20 of these did well in copying from a written text. This may be explained according to the non requirement of mental processing while copying down or that it is a mechanical, nonpropositional task. See table 9a.

Writing legibility:

The hand writing of these children was examined for legibility and classified under 1) poor: where child showed confusion between upper case and lower case and 2) average: where although legibility was not perfect, there was no confusion between upper and lower case. See table 9a.

Arithmetic Ability:

Though important enough for a separate category, in our study arithmetic abilities are classified underwriting skills owing to inadequate information and subjective evaluation. Of the 30, 24 (80%) showed difficulty in arithmetic which included gross mistakes as in ability to tell the time, date etc. See Table 9.

Table 9A : Writina Skills :

	Difficulty Present	Difficulty Absent
Writing Difficulty	30	0
Writing legibility	30	6
Arithmetic	24	20
Copying ability	10	20

The other evaluation done was on spellings and is summarized in Table 9B.

Table 9B : Writing Skills :

Spellings	Example	Difficulty Present	Difficulty Absent
Additions	Lowde-Loud	29 (97%)	1
Ommissions	holow-Hollow	29 (97%)	1
Substitutions	Bicos-because	30(100%)	0
Rotation and Reversal	d-b, h-y	26(86%)	4
Whole/part Word Reversal	Somking Smoking	26(86%)	4
Confused Serialization	Sdoptep stopped	27(90%)	3
Mirror. Writing	***- cat	6 (20%)	24(80%)

These characteristics were observed by Crichtley (1978) Saunders (1971) who had observed same findings as our study and enlisted them as relatively large size of letters, slow execution, wide spacing, tortured penmanship, deformation of letters, misuse of punctuation, lack of paragraphing etc. While these features are highly interesting they need to be further studied for greater details and also for the purposes of comparison across languages in the Indian context.

Summary and Conclusions :

The following observation could be drawn from the study:

1. While some features were directly evaluated there were certain features that were subjectively evaluated by the clinician such as extent of language comprehension and expression including vocabulary. This.do not have a direct preponderance to the clinical features of learning disability but are useful in examining the speculation of learning disability as a language disorder.
2. Similarly developmental milestones were found to be delayed in 2 of the 30 cases. This finding has no direct bearing with learning disability as such but could give an insight into learning disability as a maturational lag or retardation.

In addition the following findings were observed :

1. LD in children in India is identified mainly before 12th year and is seen predominantly in males both of which agree with literature from the west.
2. The probable predisposing/causative factors indicating but not confirming neurological disfunction are under a wider ken than most predisposing causes quoted in literature.
3. Mild cognitive impairment was indicated in many of the subjects who showed inadequate intellectual functioning and auditory discrimination. Impairment was seen more in memory than other cognitive skills which confirmed to literature.
4. All children showed emotional maladjustment of some form of the other which were more varied than quoted in literature.
5. Speech and language inadequacies were glimpsed by misarticulation and fluency disorders. It was observed that children with learning disability were more often identified by their associated problems rather than the problem of learning disability itself.
6. Learning disability was pronounced in Indian children with bilingualism especially when one language was English. This finding had no strong support in literature with regards to explanations.
7. These children exhibited characteristic reading and writing disorders as difficulty in legibility, spacing, spellings, in total concurrence with literature and all children showed characteristic classroom coping difficulties. These have not been specifically focussed so far in literature.

A point to be stressed is that all these factors had been evaluated before intervention and only the existing

features were correlated. From this first study of its kind on Indian children with learning disability we suggest the following.

- There is probably high occurrence of LD in Bilingual exposure. This needs to be studied further as bilingualism is a rule rather than exception in India.
- Emphasis should be placed on early identification of LD as well as a comprehensive assessment before embarking on therapy.
- The present study of learning disabled children in AIISH is an epidemological survey of coexisting factors. This paper stresses on the need for further detailed exploration of each of the factors identified.

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