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## Epidemiology of Communication Disorders and Its Role in Rehabilitation

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### **Abstract:**

*Background: The prevalence of communication disorders has not received required attention in the literature especially in India. Objective: To determine the prevalence of communication disorders in a multidisciplinary teaching hospital, among speech and language and hearing disorders. Setting and Study Design: A retrospective study conducted at Kasturba Medical College, Mangalore. Materials and Methods: The data was retrieved from the records documented in the Hospital records over one year duration. The disorders were broadly categorized in terms of speech, language and hearing disorders across pediatric (0- 12 years), adult (12-50 years) and geriatric (Above 50 years) age groups. Results: The prevalence was more for auditory disorders (62%) followed by language disorders (24%) and then speech disorders (14%). The disorders were more prevalent in males as compared to females for the disorders under study across all the age groups. Conclusion: Prevalence estimation is essential in the prevention or intervention strategies particularly so for the communication disorders which often go unnoticed yet have major impact on every facet of life. Key Messages: There is a need for large-scale population based prevalence studies on communication disorders in India. They often go unnoticed or does not get prioritized owing to lack of identifiable signs. This study will carry implications for current and future needs in early identification, prevention and intervention programs for these disorders.*

**Keywords:** Prevalence, Communication Disorders, Language, Speech, Retrospective

### **1. Introduction**

Communication is unique to human being which has a major role in all walks of life, and gives human beings a distinct identity compared to lower species. Communication is achieved verbally or nonverbally with the use of language. Communication refers to the sending and receiving of messages, information, ideas or feelings (Hulit and Howard 2002). Speech and language are the components of communication. Bloom (1988) describes language as a code whereby ideas about the world are represented through a conventional system of arbitrary signals for communication. Speech is the oral expression of language (Hulit and Howard 2002).

Some people will have deviations or abnormalities in their verbal communication development due to several factors, either isolated or combined. Communication disorders are potentially disabling conditions with widespread and lifelong implications. Communication disorders may affect social and emotional well-being, cognition, and behavior (Lewis, Freebair & Taylor (2000) and Bryan (2004). In an earlier study communication disorders were estimated to affect one in every 10 people and also that men and women are equally affected (Law, Boyle, Harris, Harkness & Nye 1998). According to Census Commission (2005), 21.9 million in India are disabled constituting about 2.13% of the total population, among that 0.16% constitute speech and 0.12% of hearing impairment. However, there are hardly any prevalence studies on communication disorders taken up in India. The prevalence data would be necessary to identify and prevent the disability and are required especially for impairments in communication, which often go unnoticed or does not get prioritized owing to the lack of identifiable signs. Moreover communication disorders affect individual's communication at all walks of life, in turn reflecting on the quality of life.

The prevention of communication disorders is seen as crucial component of early communication intervention (Kritzinger, 2000) Effective planning of rehabilitation services for communication impaired individuals requires adequate prevalence data to plan for the

establishment of rehabilitation programmes for individuals with handicaps and also to plan for the training of personnel. The prevalence data attempts to reduce the effect of the disorder and focuses on early detection and thereby rehabilitation.

Rehabilitation refers to the restoration of individual to the fullest physical, psychological, social, vocational and educational potential, consistent with his or her physiological or anatomical impairment and environmental limitations. It may also be considered from the perspective of the WHO(1980)classification of the consequences of disease or a disorder, in which three levels are specified: Impairment, any loss or abnormality of psychological, physiological or anatomical structure or function; Disability, any restriction or lack (resulting from impairment) of ability to perform an activity in the manner or within the range considered normal for a human being; and Handicap, a disadvantage, for a given individual, resulting from impairment or a disability that limits or prevents the fulfillment of a role that is normal (depending on age, gender, social and cultural factors).

Speech pathologists and Audiologists perform a crucial role in the rehabilitation process. Their responsibility for facilitating optimum communication function occurs in a variety of work settings, with persons representing diverse etiologies. Advances in the skill and knowledge base within the discipline and in interdisciplinary technology have provided speech pathologists an armamentarium. Several challenges make it surprisingly difficult to obtain accurate estimates of the prevalence of various speech and language disorders in children. First, accurate prevalence figures require an accepted definition of a particular condition and a reliable method for identifying whether or not a child is affected (Law, Boyle, Harris, Harkness & Nye, 2000). Speech and language disorders, however, are complex developmental conditions with varied behavioural manifestations (Lubker & Tomblin, 1998). Thus, there is little consensus on how best to define and identify these disorders (Nelson, Nygren, Walker & Panoscha, 2006). Defining and describing communication disorders remains an inexact science because we lack clear and empirically derived definitions, cut-off points, and classification systems. This has resulted in a poorly developed evidence base on which to base the identification and management of communication disorders (Reilly, Douglas, Oates, 2004)

Secondly, there is a need for large-scale cohort studies to tease out the relationship between the component parts of the equation across time and to establish a better understanding of the incidence of speech and language delays. Third, the nature of the disorders may change as children mature, thereby influencing prevalence estimates. Thus, ideally, prevalence data should be collected across the lifespan for speech and language disorders (Craig & Tran 2005 and Campbell, Dollaghan, Rockette, Paradise, Feldman, Shriberg, et al. 2003) more attention needs to be paid to the risk and protective factors and the extent to which they are influenced by confounding variables and their interactions.

Prevalence estimates are not, however, particularly valuable in and of themselves. Rather, they provide key starting points for other important inquiries about childhood speech and language disorders (Law, Boyle, Harris, Harkness & Nye, 2000 and Enderby & Pickstone 2005). Lifespan prevalence data are valuable in understanding the natural history, course, and prognosis of these disorders. Prevalence estimates also allow for assessment of possible risk and protective factors. For example, a family history of speech and language disorders may increase risk for childhood communication disorders, whereas high quality daycare experiences may decrease risk, acting as a protective factor. Risk and protective factors provide hints on causality of the disorders, as well as on prevention or intervention strategies that might help to reduce their adverse impacts on individuals and society.

Prevalence data can also be used to calculate the level of impact of intervention and to indicate the boundaries between impairment and typical development (Law, Boyle, Harris, Harkness & Nye, 2000). Prevalence estimation helps in the prevention or intervention strategies that might help to reduce the adverse impacts on individuals and society. However, there is a need for large-scale population based prevalence studies across the life span. Lifespan prevalence data are valuable in understanding the natural history, course, and prognosis of these disorders. Hence the present study was undertaken with an aim of estimating the prevalence of subgroups of communication disorders, with an objective of arriving at the epidemiological profile of individuals with communication disorders at a multidisciplinary hospital.

## 2. Method

The study followed retrospective study design. Ethical approval was obtained from the Institutional ethical board before commencing the study. The data was retrieved from the records documented in the Hospital records over duration of 12 months from January to December in 2013, in the Department of Audiology and Speech Language pathology at a multidisciplinary teaching hospital. The disorders were broadly categorized in terms of Speech, Language and Hearing disorders across, pediatric (0- 12 years), adult (12-50 years) and geriatric (Above 50 years) age groups. The gender differences were also considered. As a hospital protocol, each client was evaluated by a team of specialists comprising Pediatrician, ENT specialist, Neurologist and Psychologist. The input from Audiologist and Speech Language Pathologist formed the core for the study. The audio logical assessment comprised of Pure Tone Audiometry and the type of hearing disorders such as sensor neural, conductive and mixed hearing problems were noted.

Speech was evaluated both perceptually and objectively. The language disorders were categorized as receptive expressive language disorders secondary to pervasive developmental disorder, cerebral palsy, intellectual deficits and hearing impairment.

## 3. Results

The analysis indicated 14% of speech disorders, 24% of language disorders and 62% auditory disorders. All the disorders under study were more prevalent in males as compared to females across all the age groups. [Speech (M= 67% F= 33%) Language (M= 66% F= 34%) and Auditory (M= 59% F= 41%)]. Among the developmental language disorders, the language disorders were more prevalent for receptive expressive language disorder with unknown etiology and least for receptive expressive language disorder secondary to mental retardation (Receptive Expressive Language Disorders= 63.87%, Pervasive Developmental Disorders = 15.7%, Hearing

Impairment= 8.37% Cerebral Palsy= 6.8% and Mental Retardation= 5.23%). Among the speech disorders, articulation disorders (48.4%) were more prevalent in pediatric group, fluency disorders were more in adult group (37.2%) and geriatrics had more of voice disorders (14.4%).

#### 4. Discussion

This study aimed at studying the prevalence of communication disorders in a multidisciplinary hospital. It was observed that auditory disorders were high as compared to language and speech disorders with high prevalence rate among the males compared to females across the disorders.

The higher prevalence hearing disorders when compared to speech and language disorders could be due to the fact that auditory disorders often coexist with various signs and symptoms, owing to which the medical help is often sought as against the language and speech disorders which are symptomless. Among the hearing disorders, prevalence of sensory neural was higher specifically in geriatric group. Records showed that most of them had Diabetes mellitus and were on medication for not less than 5 years. Persons with Diabetes have a higher prevalence of hearing impairment. Geriatric hearing loss may be caused by a variety of problems, 'presbycusis', the age related hearing deterioration being the most common.

Language acquisition and development in boys and girls seem different especially because of different ways of upbringings and interactions with their environment (Morales, Mota & Keske-Soares, 2002). In the present study also communication problems were more prevalent in males in comparison to the females. Zimmerman, Satterfield, Miller, Bilder, Hossain & McMahon (2007) reported a male to female ratio of 1.8:1 for communication disorders. It could also be that the males in India receive more attention and so are better attended for deviation in health status compared to females. There are reports of significantly higher speech disorders in males as compared to females for speech-sound disorders (Aithal, 1985, Beitchman, Nair, Clegg, Patel, Ferguson & Patel 1986 and Keating, Turrell & Ozanne 2001). Jayarama & Bhat (2004) have also reported that autism was more in males as compared to females in a study done in the same hospital in 2013. It is evident that the scenario of male to female ratio has remained the same over the years for communication disorders.

The prevalence of receptive expressive language disorder of unknown etiology was the highest. It is because we lack clear and empirically derived definitions, cut-off points, and classification systems among the communication disorders. Communication disorder is an overarching term that encompasses a variety of different disorders (Ruscello, St. Louis & Mason 1991). Unlike the medical conditions, it has always been difficult to be specific about the acquired skills in communication and so the identification/reporting / seeking professional guidance has been consistently poorer in communication disorders especially so in a country like India with high illiteracy.

In the last 15 years, epidemiological surveys of pervasive developmental disorders have shown increasing prevalence estimates that reflect broadening of the concept and diagnostic criteria for autism as well as increased awareness and improved detection of pervasive developmental disorders at all ages. It is estimated that 1 in every 150 children in the United States has an Autism Spectrum Disorders (Centers for Disease Control and Prevention 2007). With this scenario the awareness about the disorder has improved over days both amongst the professionals and the general public which is reflected in the higher prevalence of language disorders secondary to PDD in this study also.

The lesser prevalence of language disorders secondary to intellectual disability and cerebral palsy in spite of the fact that communication disorders occur in this population as a rule could be due to the fact that once the diagnosis is established for these conditions, parents focus more on other challenges of disability such as motor abilities and communication impairment does not get prioritised. It could also be that the place of study offers specialised training centres for these disorders and so they may not be approaching the hospital wherein this study was conducted.

Among the speech disorders the articulation disorders were highest in paediatric group. The lower prevalence rates at older ages are consistent with evidence that speech sound disorders may resolve over time (Shriberg, Kwiatkowski & Gruber 1994). Alan et al. (1987) reported significant prevalence of stuttering among adults, the increased prevalence among male group which is in consonance with the present study. Craig & Tran (2005) had observed substantially lower prevalence rates of stuttering in adolescent males and females (0.8% and 0.2% respectively). It can be observed that the male still had higher prevalence than females in their study too.

The voice deviations were more marked in geriatrics group. The older adults may be at increased risk for disordered voice because of possible alteration of voice use patterns, the presence of vocal fold lesions (e.g., carcinoma, Reinke's edema, and paralysis), development of systemic diseases known to be associated with alterations in laryngeal function and voice production (e.g., stroke, respiratory disease, and arthritis), and degenerative changes in the structure and function of the vocal fold mucosa, musculature, and peripheral nerve supply (Linville, 2001). Linville, (1987) opines that these deviations in pitch, pitch range, loudness, and quality can alter quality of life. The voice disorders limiting social interaction in the elderly indicates the need to focus on this aspect in them. (Verdonck-de Leeuw & Mahieu 2004).

While concluding the findings of this study, the epidemiological studies that rely on record reviews may be hampered by the amount and quality of information available from the record should be born in mind (Van Naarden Braun, Pettygrove, Daniels, Miller, Nicholas, Baio, et al. (2007). Prevalence rates may be affected by the rate of referral of children, the sensitivity of the evaluations used, and administrative eligibility requirements of the source. It should also be noted that clinical samples are not optimal for determining prevalence, as children who are referred for speech-language services are known to differ systematically from those identified in population samples (Johnson, Beitchman, Young, Escobar, Atkinson, Wilson, et al. 1999 and Zhang & Tomblin, 2000).

There is no evident reason for the differences in prevalence studies over time. The variations in prevalence rates among the published

studies could be that individual interpretations of the diagnostic criteria used have affected the results of different studies, even if real variations exist. Considering the wide variety of possible behavioral manifestations of the triad of impairments and the changes over time, it is not surprising that there is difficulty in achieving consistency in diagnosis among workers in different areas. A challenge for our society is to foster the science required to promote better futures for these children in a world where academic, social, and economic success relies heavily on communication skills (Ruben, 2001).

## 5. Conclusion

Communication disorders are potentially disabling conditions with widespread and lifelong implications. Communication disorders affect social and emotional well-being, cognition, and behavior. The current paper demonstrates the importance of surveying the epidemiology data among the communication disorders. The prevalence was more for auditory disorders (62%) followed by language disorders (24%) and then speech disorders (14%). The disorders were more prevalent in males as compared to females for all the disorders across all the age groups. This study will carry implications for current and future needs in early identification, prevention and intervention programs for these communication disorders. However, there is a need for large-scale population based prevalence studies on communication disorders in India.

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