

Original Article

A Study of Co-Morbidity in Mental Retardation

Harshada Makena, Prashanth Ampalam, K Narasimha Reddi

Abstract : Mental retardation (MR) is a condition of arrested or incomplete development of the mind, characterized by impairment of skills (cognitive, language, motor and social) manifested during the developmental period, which contribute to overall level of intelligence. Intellectual Disability is a more precise term (used in DSM-V). MR is an etiological factor for development of various co-morbidities, which account for substantial burden of the disease. However, the extent of this co-occurrence varies substantially between reports. **Aim:** To study the prevalence of psychiatric and medical comorbidity, among different degrees of Mental Retardation. **Settings and Design:** This is a cross-sectional, single-centered study conducted at the out patient department of Psychiatry, Maharajah's Institute Of Medical Sciences. **Material & Methods :** Sixty-three persons, who came for disability certification, were diagnosed with MR as per ICD-10 criteria, The Wechsler's Adult Intelligence Scale – IV and The Developmental Screening Test for IQ and Vineland Social Maturity Scale for SQ assessment were used. Psychiatric and medical co-morbidities were diagnosed, using clinical examination, laboratory investigation, the ICD-10 Diagnostic criteria and CHA-PAS SCALE. **Statistical Analysis :** The statistical analysis was done by using the Statistical Package for Social Sciences (SPSS) 13.0 version. Frequency, percentages and chi square analysis were used to analyze the data. **Result :** Out of 63, 40 were found to have medical co-morbidity, while 38 were found to have psychiatric co-morbidity. Severe and profound MR was almost always associated with medical co-morbidities, while mild to moderate MR with psychiatric illness. Different co-morbid disorders were analyzed and discussed. **Conclusions :** Evaluation and diagnosis of co-morbid disorder in different degrees of MR is of paramount importance in order to modify treatment schedules and improve the patient outcomes.

Keywords : Mental retardation, psychiatric co-morbidity, medical co-morbidity

Introduction

There is evidence of recognition and treatment of intellectual disability that dates back to Hippocrates, Galen & the Middle Ages. The modern history for the field of intellectual disability begins in the late 18th century¹. The term co-morbidity indicates co-existence of an index disease with another clinical entity. It is increasingly recognized that co-morbidity is more common among people with intellectual disabilities than among the general population. It has now been clearly documented that the mentally retarded are at a greater risk of developing psychiatric disorders (Borthwick- Duffy & Eyman, 1990)² and medical illness. Dual diagnosis refers to the joint occurrence of mental retardation and psychiatric disorders. The rates of dual diagnosis have varied from 31% to 100% across various studies (Jacobson, 1982)³. Indian review of results of previous studies on co-morbidities stressed on mood disorder (8%), hyperkinetic disorder (14%), autism (11%), psychosis (11%), conduct disorder (2%)

enuresis (2%) and unspecified emotional and behavioral disorder (26 %)⁴, mostly not based on any scale but rather the examiners expertise and the ICD-10 & DSM-IV diagnostic guidelines. A Taiwan study using a structured questionnaire indicated that nearly half (47.7%) of the subjects with MR had an associated co-morbid medical or psychiatric illness. A population-based study using a Learning Disability Register in the UK reported that the prevalence of epilepsy was 26% in adults with intellectual disabilities. In view of the common interface of medical and mental-health problems in mentally retarded, initiatives should be taken to enhance their healthcare following a multidisciplinary approach, laying emphasis on dual diagnosis and diagnostic overshadowing. Since there is inconsistency among various reports of occurrence of co-morbidities in MR, this study has been conducted.

Aims & Objectives

To study the prevalence of psychiatric and medical comorbidity, in persons with different degrees of mental retardation.

Materials and Methods

This is a cross-sectional, single-centered study conducted in the Psychiatry Out-Patient Department of a tertiary care General Hospital, from February 2013 to May 2013. Sixty three persons, who came for disability certification, were taken into the study after obtaining the informed consent from the concerned. The data was recorded in a semi-structured proforma and included socio-demographic profile, primary assessment including case history, complete physical and mental status examination. All subjects included in this study were between 5 years and 60 years.

Diagnosis of mental retardation was made as per ICD-10 classification. The degree of retardation was assessed based on the intelligence quotient and social quotient by using the following tests:-

Developmental Screening Test⁵ : It was developed by Bharath Raj (1977, 1983) and consists of 88 items, which represent the behavioral characteristics of respective age levels, from birth to 15 years of age. At each age level, items are drawn from behavioral areas, like motor development, speech, language, and personal-social development. Appraisal of the child can be done in semi-structured interview with a parent. The IQ calculator incorporated with the test folder helps in ready computation of IQ from mental age and the chronological age. DST showed very high positive correlation +0.7215 to +0.9968 with other intelligence or developmental tests. Inter-scorer reliability (+0.928) and test retest reliability (+0.98) were also found to be high and satisfactory.

The Wechsler Adult Intelligence Scale - IV⁶ : It is a standardized scale developed by David Wechsler and revised by Pearson and was released in 2008. It is composed of 10 core sub-tests and five supplemental sub-tests, with the 10 core sub-tests comprising the Full Scale IQ. It measures IQ in individuals aged 16–90 years. It takes 60-90 minutes to evaluate. The web based evaluation and scoring option was used to interpret the index and sub-test level scale scores.

Vineland Social Maturity Scale-Indian Adaption⁷: It was developed by J Bharath Raj Mallin and was published in 1984. It is an 89-item questionnaire assessing 4 domains. It takes 20-40 minutes to administer and evaluates the social age, social quotient and adaptive functioning ranging from 0 -15 years. E.A. DOLL originally devised the VSMS

in 1935 and since then this test is being used in many parts of the world. The administration should be carried out in a semi-structured informal atmosphere. At the end of assessment Full and Half credits may be counted. If the total score falls exactly on the last item of an age level, the patient is given the full Social Age at that age level. The procedure for obtaining the Social Age from the Raw is as follows.

$$S.Q = (\text{Social Age} / \text{Actual Age}) \times 100$$

The interpretations of S.Q are on similar lines as that of I.Q Except that S.Q has a social life reference. Research studies (Goulet and Barelay 1962)¹⁶, have shown a consistent and high correlation between VSMS Social Age (S.A) and the Stanford Binet M.A DOLL reported a correlation of + = 0.85 and Patterson (1943) reporting a correlation of + = 0.96 with the Binet scale on a sample of normal children.

The patients were divided into 4 groups depending on the degree of retardation, as per ICD-10, which were as follows: -

- A. Mild Mental Retardation (IQ range 50 to 69)
- B. Moderate Mental Retardation (IQ range 35 to 49)
- C. Severe Mental Retardation (IQ range 20 to 34)
- D. Profound Mental Retardation (IQ range less than 20)

All these were evaluated for the presence of any co-morbid psychiatric illness using the CHA-PAS scale and ICD-10. The Child and Adolescent Psychiatric Assessment Schedule (CHA-PAS)⁸ is a semi-structured clinical interview developed by Steve Moss, Robin Friedlander and Pauline Lee, first published in 2007. It is a 97-item questionnaire covering 8 domains, namely anxiety disorder, depressive episode, manic episode, OCD, psychosis, ADHD, conduct disorder and autism spectrum disorder. It is a four-point scale constructed around ICD-10 and DSM-IV criteria, with strong diagnostic indications. The CHA-PAS score form enables two different clinical episodes to be rated on the same form with a provision to interview a second informant to generalize findings. It uses a scoring system that provides a single score for each diagnostic category and each of the categories has a corresponding threshold. If the person reaches or exceeds the threshold it is probable that they warrant a diagnosis in that category. Due to age disparity and to maintain uniformity this scale was selected. Other psychiatric disorders were diagnosed based on the ICD-10 criteria.

A complete physical examination with necessary laboratory investigations was than to assess the presence of co-morbid medical conditions like epilepsy, infectious diseases, hearing impairment, tuberous sclerosis, cerebral palsy, bowel & bladder incontinence, hypothyroidism, recurrent fever, orthopedic handicap, cleft lip & cleft palate, plexiform neurofibromatosis, mucopolysaccharidosis, sexual dysfunction, asthma and enuresis.

Ethical approval

Informed consent was obtained from parents or legal representatives, and the study has been approved by the Ethical Board of the tertiary care institute.

Data Analysis

The statistical analysis is done by using the Statistical Package for Social Sciences (SPSS) 13.0 version. Frequency, percentages and chi square analysis were used to analyze the data. The following results were drawn.

Results

Demographics and Prevalence

The study sample constituted of 63 patients, out of which 29(46%) were of mild MR, 9(14.3%) of moderate MR, 12(19%) of severe MR and 13(20.6%) were of profound MR (Table-1).

Thirty four (53.9%) patients were males and 29 (46.1%) were females, 39(61.9%) were below 18 years while 24 (38.1%) were above 18 years (Table 1). Profound MR was more common in the below 18 age group.

TABLE 1 : SOCIO DEMOGRAPHIC PROFILE IN DIFFERENT DEGREES OF MR

		MILD	MODERATE	SEVERE	PROFOUND	TOTAL
GENDER	MALE	(16) 25.4%	(4) 6.3%	(9) 14.3%	(5) 7.9%	(34) 53.9%
	FEMALE	(13) 20.6%	(5) 7.9%	(3) 4.7%	(8) 12.7%	(29) 46.1%
AGE	BELOW 18	(17) 27%	(4) 6.3%	(6) 9.5%	(12) 19.1%	(39) 61.9%
	ABOVE 18	(12) 19.1%	(5) 7.9%	(6) 9.5%	(1) 1.6%	(24) 38.1%
TOTAL		(29) 46%	(9) 14.3%	(12) 19%	(13) 20.6%	(63) 100%

A total of 52 (82.53%) were diagnosed with a co-morbid disorder, while 11(17.46%) patients had no co-morbid illness. Twenty-six (41.26%) patients had both psychiatric and medical illness, 14 (22.22%) had only medical co-morbidity while 12 (19.06%) had only psychiatric co-morbidity (Figure 2). Psychiatric co-morbidity was present in 38 ($P=0.975$) patients out of which 17(44.7%) belonged to mild, 6(15.8%) to moderate, 7(18.4%) to severe and 8(21.1%) to profound MR. Forty($P=0.030$) patients had a medical disease out of which 16 (40%) were associated with mild MR, 3(7.5%) with moderate, 10(25%) with severe and 11(27.5%) with profound MR, (Table 2, Figure 1,2,3).

FIGURE 1 : OVERVIEW OF PREVALENCE OF PSYCHIATRIC & MEDICAL CO-MORBIDITY

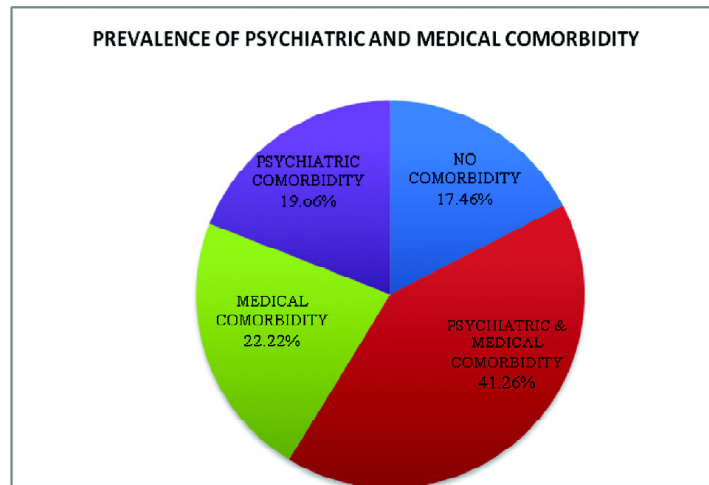


TABLE 2 : PREVALENCE OF CO-MORBIDITY IN DIFFERENT DEGREES OF MR

	MILD	MODERATE	SEVERE	PROFOUND	TOTAL	CHI-SQUARE
MEDICAL COMORBIDITY	(16) 40%	(3) 7.5%	(10) 25%	(11) 27.5%	(40) 100%	VALUE- 8.938 DF-3 SIG- 0.030
PSYCHIATRIC COMORBIDITY	(17) 44.7%	(6) 15.8%	(7) 18.4%	(8)21.1%	(38) 100%	VALUE- 214 DF- 3 SIG- 0.975
NO COMORBIDITY	(6) 54.5%	(2) 18.2%	(2) 18.2%	(1) 9.1%	(11) 100%	VALUE- 1.217 DF- 3 SIG- 0.749

FIGURE 2 : PREVALENCE OF CO-MORBIDITY IN DIFFERENT DEGREES OF MR

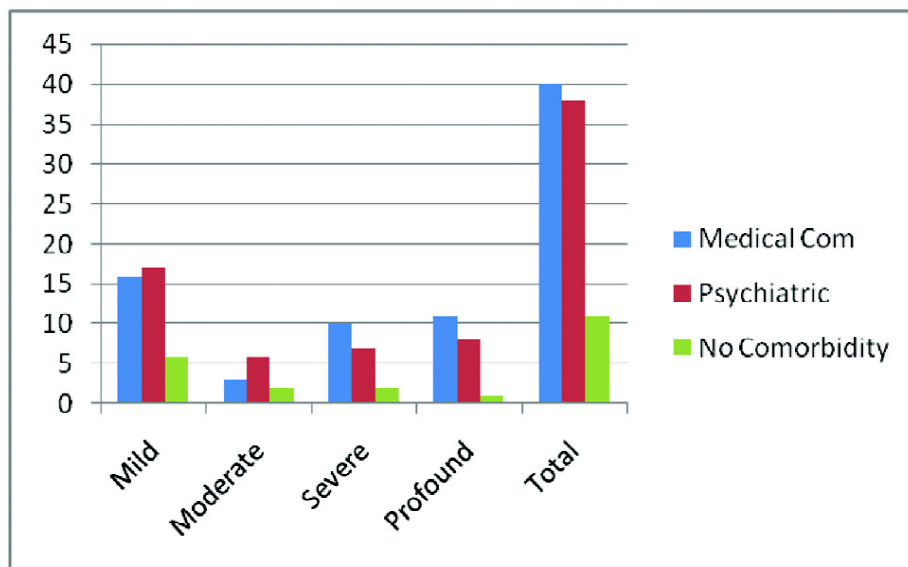
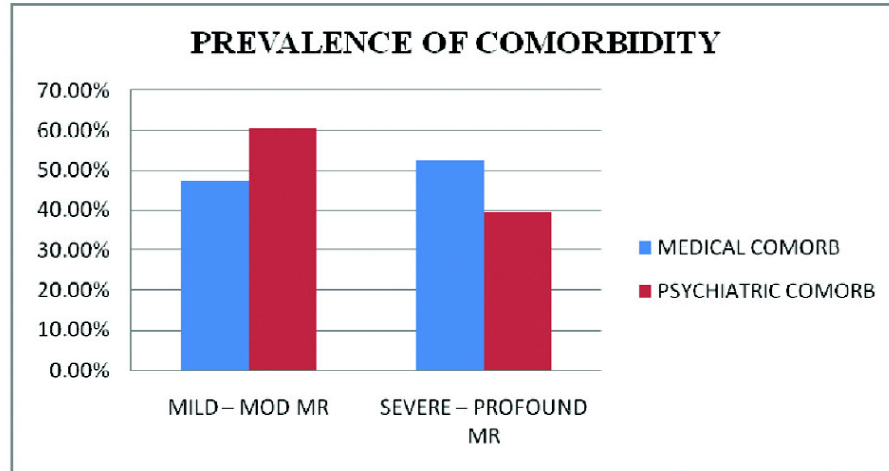


FIGURE 3 : PREVALENCE OF CO-MORBIDITY IN DIFFERENT DEGREES OF MR



Most frequently seen psychiatric co-morbidity was Stereotyped Movement Disorder (36.85%) followed by Conduct Disorder (23.7%) and ADHD (18.42%). The frequency of Stereotyped Movement Disorder and Autism Spectrum Disorders (10.52%) was more in severe to profound MR, while Conduct disorder, Psychosis (2.63%), OCD (5.26%), Depressive episode (8%), Manic episode (5%) and Anxiety disorders (13%) were common in mild to moderate MR. ADHD was seen equally across mild, moderate and severe MR and less in profound MR. Eating Disorders (5.26%) and PTSD (5.26%) were associated with mild and severe MR, while Separation Anxiety Disorders (5.26%) with mild and profound MR. Habit and Impulse Disorders (2.63%) and Tic disorder (2.63%) were seen in moderate MR (Table 3, Figure 4).

The most common medical co-morbidity seen was epilepsy (45%) followed by cerebral palsy (15%). Other frequently

seen medical co-morbidity was cleft lip & cleft palate (7.5%), asthma (10%) and recurrent fevers (7.5%). Epilepsy was seen across all degrees of MR but more common in Mild & Sever MR. Recurrent Fever was diagnosed equally across mild, severe & profound MR, Cleft Lip & Cleft Palate across mild, moderate & profound MR, Asthma & cerebral palsy across mild & profound MR while orthopedic handicap (5%) was equally associated with mild & severe MR. Enuresis (5%) and Plexiform neurofibromatosis (2.5%) were diagnosed in profound MR while rare syndromes like Mucopolysaccharidosis (5%) was seen in severe MR. Infectious diseases (2.5%), Hearing impairment (2.5%), tuberous sclerosis (2.5%), hypothyroidism (2.5%) and bowel & bladder incontinence (5%) were found in Mild MR. Sexual dysfunctions (2.5%) was seen in moderate MR. (Figure 5, Table 4).

FIGURE 4 : FREQUENCY DISTRIBUTION OF VARIOUS PSYCHIATRIC DISORDERS IN DIFFERENT DEGREES OF MR

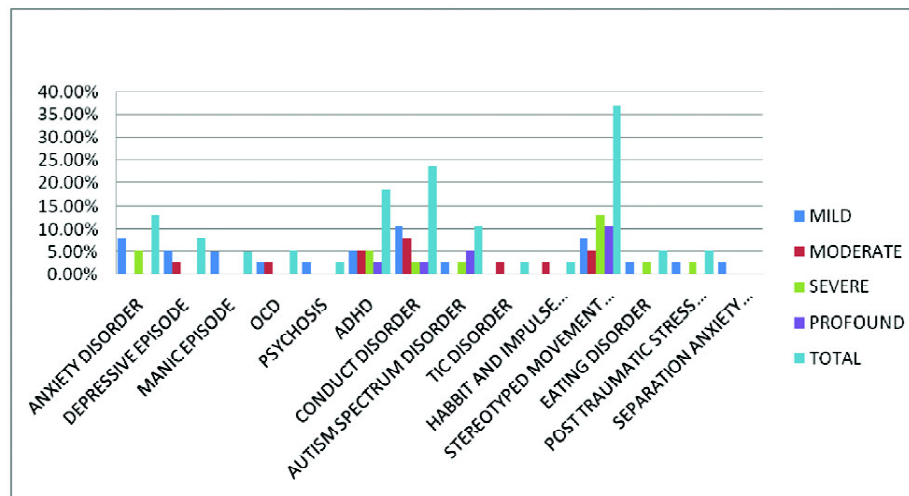


FIGURE 5 : FREQUENCY DISTRIBUTION OF VARIOUS MEDICAL DISORDERS IN DIFFERENT DEGREES OF MR

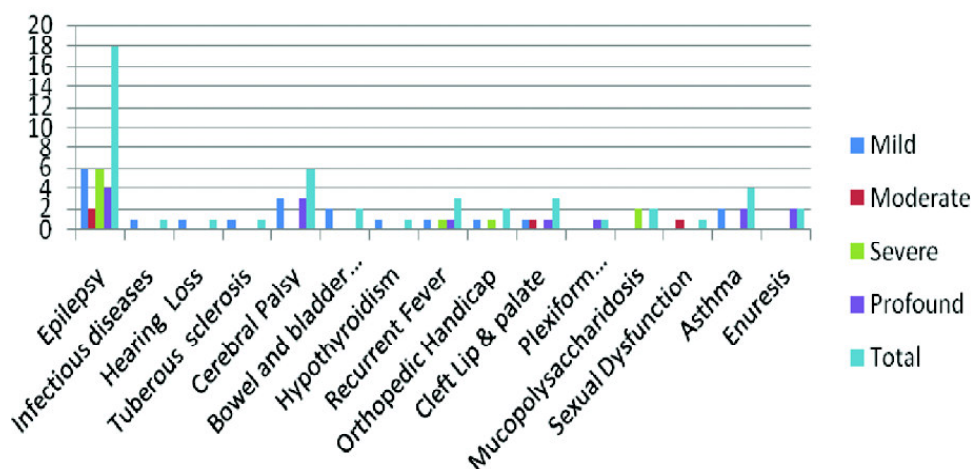


TABLE 3 : FREQUENCY DISTRIBUTION OF VARIOUS PSYCHIATRIC DISORDERS IN DIFFERENT DEGREES OF MR

PSYCHIATRIC COMORBIDITY	MILD	MODERATE	SEVERE	PROFOUND	TOTAL
ANXIETY DISORDER	(3) 7.89%	(0)	(2) 5.26%	(0)	(5) 13.75%
DEPRESSIVE EPISODE	(2) 5.26%	(1) 2.63%	(0)	(0)	(3) 7.89%
MANIC EPISODE	(2) 5%	(0)	(0)	(0)	(2) 5%
OCD	(1) 2.63%	(1) 2.63%	(0)	(0)	(2) 5.26%
PSYCHOSIS	(1) 2.63%	(0)	(0)	(0)	(1) 2.63%
ADHD	(2) 5.26%	(2) 5.26%	(2) 5.26%	(1) 2.63%	(7) 18.41%
CONDUCT DISORDER	(4) 10.5%	(3) 7.89%	(1) 2.63%	(1) 2.63%	(9) 23.65%
AUTISM SPECTRUM DISORDER	(1) 2.63%	(0)	(1) 2.63%	(2) 5.26%	(4) 10.52 %
TIC DISORDER	(0)	(1) 2.63%	(0)	(0)	(1) 2.63%
HABIT AND IMPULSE DISORDERS	(0)	(1) 2.63%	(0)	(0)	(1) 2.63%
STEREOTYPED MOVEMENT DISORDERS (SELF INJURIOUS BEHAVIOUR)	(3) 7.89%	(2) 5.26%	(5) 13.15%	(4) 10.5%	(14) 36.8%
EATING DISORDER	(1) 2.63%	(0)	(1) 2.63%	(0)	(2) 5.26%
POST TRAUMATIC STRESS DISORDER	(1) 2.63%	(0)	(1) 2.63%	(0)	(2) 5.26%
SEPARATION ANXIETY DISORDER	(1) 2.63%	(0)	(0)	(1) 2.63%	(2) 5.26%

TABLE 4 : FREQUENCY DISTRIBUTION OF VARIOUS MEDICAL DISORDERS IN DIFFERENT DEGREES OF MR

MEDICAL COMORBIDITY	MILD	MODERATE	SEVERE	PROFOUND	TOTAL
EPILEPSY	(6) 15%	(2) 5%	(6) 15%	(4) 10%	(18) 45%
INFECTIOUS DISEASES	(1) 2.5%	(0)	(0)	(0)	(1) 2.5%
HEARING IMPAIRMENT	(1) 2.5%	(0)	(0)	(0)	(1) 2.5%
TUBEROUS SCLEROSIS	(1) 2.5%	(0)	(0)	(0)	(1) 2.5%
CEREBRAL PALSY	(3) 7.5%	(0)	(0)	(3) 7.5%	(6) 15%
BOWEL AND BLADDER INCONTINENCE	(2) 5%	(0)	(0)	(0)	(2) 5%
HYPOTHYROIDISM	(1) 2.5%	(0)	(0)	(0)	(1) 2.5%
RECURRENT FEVER	(1) 2.5%	(0)	(1) 2.5%	(1) 2.5%	(3) 7.5%
ORTHOPEDIC HANDICAP	(1) 2.5%	(0)	(1) 2.5%	(0)	(2) 5%
CLEFT LIP & PALATE	(1) 2.5%	(1) 2.5%	(0)	(1) 2.5%	(3) 7.5%
PLEXIFORM NEUROFIBROMATOSIS	(0)	(0)	(0)	(1) 2.5%	(1) 2.5%
MUCOPOLYSACCHARIDOSIS	(0)	(0)	(2) 5%	(0)	(2) 5%
SEXUAL DYSFUNCTION	(0)	(1) 2.5%	(0)	(0)	(1) 2.5%
ASTHMA	(2) 5%	(0)	(0)	(2) 5%	(4) 10%
ENURESIS	(0)	(0)	(0)	(2) 5%	(2) 5%

Discussion

In the present study 60.31% patients had a dual diagnosis, which is similar when compared with other clinical based studies (Philips & Wiffiams, 1975⁹; Szymanski, 1977¹⁰; Eaton & Menolascino, 1982¹¹). Medical disorders were present in 63.49%, which was found to be more when compared with a study done in children with MR by Khess CRJ et al, 1998 where in a psychiatric disorder was present in 56.17% of the cases, and a medical disease was present in 35.0% of the patients²⁴. It was observed that psychiatric co-morbidity was more prevalent in mild to moderate levels of retardation, while opposed to medical co-morbidity which was more prevalent in severe to profound retardation ($P=0.030$). Hence patients with a psychiatric disorder had a milder level of retardation compared to patients with a medical illness. This finding could partly be a reflection of the fact that distinguishing a behavior disturbance from a psychiatric disorder is easier in patients with a milder degree of retardation, hence using operational criteria for

diagnosis is more feasible in such cases. On the other hand while dealing with more severely retarded patients, we need to make concessions for diagnostic overshadowing (Riess & Szyszko, 1983)¹⁸. The other explanation for this could be the fact that patients with medical illness might have suffered from a cerebral damage which was responsible for the retardation as well as the medical illness (like epilepsy), hence the degree of retardation was more in such cases. Malformations and degenerative disorders of the central nervous system are known to be associated with severe neurological abnormalities and cognitive impairment (Bregman & Harris, 1995)¹⁹.

The most common psychiatric disorder found in our study was Stereotyped Movement Disorder, followed by Conduct Disorder and ADHD. This finding was consistent with the views of Lewis and Maclean (1982)¹², who after reviewing the literature, had come to the conclusion that most studies irrespective of the sample and the

methodology, support an increased prevalence of behavioral and emotional disorders. Stereotyped Movement Disorder and Autism Spectrum Disorder were more common in severe to profound MR. Often this is the reason for referral and the focus for psychiatric intervention. Conduct disorder, Psychosis, OCD, Depressive episode, Manic episode and Anxiety disorders were more common in mild to moderate MR. Mood disorders were found to be common in the mild mental retardation. Earlier studies have observed that depression is diagnosed more often in the mildly retarded than in the more severely retarded (Ries et al., 1982,¹³), as the latter may have difficulty in communicating subjective states. Similarly severely retarded manic patients may be lacking in the quality of infectious gaiety and their delusions could be naive (Fraser & Nolan, 1994,¹⁴). Hence we have to be aware that the clinical presentation may be altered depending on the patient's communicative skills (Szymanski, 1988,¹⁵).

In this study, 2.63% of the patients were found to have psychosis, which is consistent with previous literature. But a review of previous Indian studies have quoted a higher prevalence rate of 11%, the disparity may be because of not applying the CHA PAS scale specific to MR.^{1,4}

ADHD was more commonly associated with mild, moderate and severe MR. Eating Disorders, PTSD and Separation Anxiety Disorders were consistently found in mild MR. Habit and Impulse Disorder and Tic disorder were seen in moderate MR. This frequency distribution was consistent with earlier findings.

63.49% of present sample were diagnosed to have a medical illness of which 52.5% were associated with severe to profound MR. Epilepsy was the most common medical illness, seen in 45% of the patients. Epilepsy had been reported to be common among the retarded, especially the severely retarded (Corbett et al., 1975)¹⁷. Epilepsy, Cerebral palsy, recurrent fevers, orthopedic handicap, cleft lip and cleft palate, asthma, enuresis and rare syndromes like Mucopolysaccharidosis and plexiform neurofibromatosis were consistently associated with severe to profound MR. Infectious diseases, hearing impairment, tuberous sclerosis, hypothyroidism, bowel and bladder incontinence, sexual dysfunctions were commonly associated with Mild to Moderate MR.

In the present series of patients, psychiatric illness and medical illness were found to coexist in 41.26% of the cases. This is consistent with a biological theory, which presumes that the brain dysfunction that results in mental retardation also predisposes the individual to a mental disorder (Szymanski et al, 1989)²⁰. Mucopolysaccharidosis causing retardation and ADHD, Plexiform neurofibromatosis, tuberous sclerosis causing retardation and hyperactivity disorder or autism and epilepsy causing retardation and a wide range of psychopathology are well-recognized facts (Szymanski, 1994)²¹.

Conclusion

In conclusion, Psychiatric co-morbidity was more common in mild to moderate mental retardation. Medical co-morbidity was more common in severe to profound mental retardation. Most common psychiatric illness is Stereotyped Movement Disorder, whereas Epilepsy is most common medical illness. Medical illness was more prevalent in severe MR. Psychiatric disorders are commonly diagnosed in milder degrees of retardation as compared to severe retardation, due to diagnostic overshadowing. In such cases, facts like impaired language development behavioral changes, biological changes, family history of mental illness (Sovner, 1989)²² and the longitudinal history (Tyrrer & Shakour, 1990)²³, have to be considered, rather than solely depending on a diagnostic criterion (Szymanski, 1994)²¹ or else this could lead to therapeutic nihilism, as we might not make an attempt to treat such cases adequately. In view of the common interface of medical and mental-health problems in mentally retarded, initiatives should be taken to enhance their healthcare following a multidisciplinary approach, laying emphasis on dual diagnosis and diagnostic overshadowing.

Limitations

This was an OPD based study, with a small sample of patients who have come for disability certification that might not have been a true representative of the general population. No specifically designed instrument to assess medical co-morbidity in the retarded was used.

References

- 1] Sadock BJ and Sadock VA. (eds.) Kaplan and Sadock's Comprehensive Textbook of Psychiatry. 9th edition. Vol 2 Philadelphia: Lippincott, Williams & Wilkins, 2009.
- 2] Borthwick-Duffy, S. A. & Eyman, R. K. (1990) Who are the dually diagnosed? American Journal on Mental Retardation, 94, 586– 595.
- 3] Jacobson, J.W. (1982) Problem behaviour and psychiatric impairment within a developmentally disabled population : behaviour frequency. Applied Research in Mental Retardation, 3,121 -139.
- 4] Jauhari, P., Bhargava, R., Bhave, A., Kumar, C. and Kumar, R. (2012), Comorbidities Associated With Intellectual Disability among Pediatric Outpatients Seen at a Teaching Hospital in Northern India. Journal of Policy and Practice in Intellectual Disabilities, 9: 10–16. doi: 10.1111/j.1741-1130.2012.00327.x
- 5] Bharath Raj, J. (1983) DST Manual + know your child's intelligence and how to improve it. Mysore : Swayamsidha Prakashana.
- 6] Wechsler D, (2008), Wechsler Adult Intelligence Scale – 4th edition, Pearson ,
- 7] Desai AS, Et al (2009), Neuropsychological and Behavioural Evaluations, Journal of the Indian Academy of Applied Psychology October 2009, Vol. 35, Special Issue, 163-172.
- 8] Moss, S, Friedlander R, Lee P, (28 December 2013), The ChA-PAS Interview Handbook and Clinical Interview Pavilion Publishing and Media , UK
- 9] Philips, I. & Williams, N. (1975) Psychopathology and mental retardation . A study of 100 mentally retarded children. American Journal of Psychiatry, 132,1265-1271.
- 10] Szymanski, L.S. (1977) Psychiatric diagnostic evaluation of mentally retarded individuals. Journal of American Academy of Child Psychiatry, 16,67-87.
- 11] Eaton, L.F. & Menolascino, F.J. (1982) Psychiatric disorders in the mentally retarded : types, problems and challenges American Journal of Psychiatry, 138,1297-1303.
- 12] Lewis, M. & Maclean, W. (1982) Issues in treating emotional disorders, In Psychopathology in the Mentally Retarded, (Eds) Matson, J. & Barret, R., New York : Grune & Stratton.
- 13] Ries, S., Levitan, G.W. & McNally, R.J. (1982) Emotionally disturbed mentally retarded people : an underserved population. American Psychologist, 37, 361-367
- 14] Fraser, W. & Nolan, M. (1994) Psychiatric disorders in mental retardation, In : Mental Health in Mental Retardation Recent Advances and Practices, (Ed.) Bouras, N., Cambridge : Cambridge University Press.
- 15] Szymanski, L.S. (1988) Integrative approach to diagnosis of mental disorders in retarded persons, In: Mental Retardation and Mental Health : Classification, Diagnosis, treatment, Services, (Eds) Stark, J.A., Monolascino, F.J., Albarelli, M.H. & Gmy, V.C., New York : Springer-Verlag.
- 16] Kumar D, Et al , (2013) , Social Maturity Of Senior Secondary School Students in Relation To Their Personality, Asian Journal Of Multi Dimensional Research, vol 2,issue 8, ISSN 2278-4853
- 17] Corbett, J.A., Harris, R. & Robinson, R.G. (1975) Epilepsy, In : Mental retardation and developmental disabilities, An Annual Review, Vol, 7, (Ed.) Wortis, J., New York : Brunner-Maze).
- 18] Ries, S. & Szyszko, J. (1983) Diagnostic overshadowing and professional experience with mentally retarded persons. American Journal of Mental Deficiency, 87, 396-402.
- 19] Bregman, J.D. & Harris, J.C. (1995) Mental retardation, In : Comprehensive Test book of Psychiatry (Eds.) Kaplan, H.I. & Sadock, B.J., Baltimore : Williams and Wilkins.
- 20] Szymanski, L.S. (1988) Integrative approach to diagnosis of mental disorders in retarded persons, In : Mental Retardation and Mental Health : Classification, Diagnosis, treatment, Services, (Eds) Stark, J.A., Monolascino, F.J., Albarelli, M.H. & Gmy, V.C., New York : Springer-Verlag.
- 21] Szymanski, L.S. (1994) Mental retardation and mental health : concepts aetiology and incidence, In : Mental Health in Mental Retardation : Recent Advances and Practices, (Ed.) Bouras, N., Cambridge : Cambridge University Press.
- 22] Sovner, R. (1989) The use of valproate in treatment of mentally retarded persons with typical and atypical bipolar disorders. Journal of Clinical Psychiatry, 50, 40-43.
- 23] Tyrer, S. & Shakour, Y. (1990) The effect of lithium in the periodicity of aggressive episode, In : Key Issues in Mental Retardation Research, (Ed.) Fraser, W.I., pp 121-129, London : Routledge.
- 24] Khess C R J, Et Al (1998), Comorbidity In Children With Mental Retardation, Indian Journal Of Psychiatry ,40(3), 289-294

Financial Support : Declared None

Conflict of Interest : Declared None