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ORIGINAL ARTICLE

Prevalence of Regression of Developmental Skills in Autism Spectrum Disorder: Report from Pakistan

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ABSTRACT

Objective: To find the prevalence of regressive versus developmental delay pattern in autistic children.

Study Design: Retrospective study.

Place & Duration of Study: The study was conducted at Children Department; Pakistan Institute of Medical Sciences. Duration of study was three years from June 2017 to August 2020.

Material and Methods: All children ≤5 years coming first time for assessment of ASD and diagnosed on Autism Diagnostic Interview-Revised ADI-R and Autism Diagnosis Observation Schedule ADOS-2 were included in the study. Total 330 children fulfilled the criterion. Detailed history and developmental details of early development were taken. Data was entered and analyzed in SPSS v25.

Results: Mean age of the children was 4.6 ± 3.88 years with male preponderance (n=255, 77.3%). Ninety-one (27.6%) of the children had positive family history. Regression of milestones was found in thirty-nine (11.8%) of the patients while developmental delay was present in 291 (88.2%) of the children. Males were found to have higher risk (OR=6.2, RR=5.4, p<0.01) of regression than females. No association (OR=0.89, RR=0.91, p=0.77) was found between regression of milestones and positive family history of disease.

Conclusion: Results of current study indicate that regressive autism is not uncommon in Pakistani population. This should be given appropriate consideration otherwise it can lead to misdiagnosis resulting in poor prognosis.

Key Words: *Autism, Autism spectrum disorder, Regression, Developmental delay, Regressive autism.*

INTRODUCTION

Autism Spectrum Disorder (ASD) epitomizes heterogeneous group of developmental disorders characterized by difficulty in communication, social interaction along with stereotypical behaviors including repetitive motor behaviors, aggression, hyperactivity and impairment in sensation.[1] Lack of emotional management and intellectual disability is also present in half of the children affected with ASD. Children with ASD also have higher rate of co-morbidities including epilepsy, Attention Deficit Hyperactivity Disorder, Learning Disabilities, Obsessive Compulsive Disorder, dyslexia, immune disorders, and other behavioral disorders.[2]

Each year 1 in 160 children are affected by ASD. In Pakistan, its prevalence is unknown. Also due to lack of awareness many of them are misdiagnosed and many did not seek any medical advice due to the stigma associated with mental disorders.[3] Different scales are in use to diagnose autism, of which Autism Diagnosis Observation Schedule (ADOS) is the most authentic one. ADOS is standardized semi-structured evaluation of social skills, communication skills, imaginative play and repetitive behaviors. ADOS-2 is currently considered as gold standard.[4]

Autistic children usually have different developmental trajectory than other children. Also, it commonly manifests in two different patterns i.e. either there is a delay in achievement of milestones or regression of milestones. Regression is defined as initial timely achievement of developmental milestone followed by loss of previously developed skill. Other manifestations may include timely achievement of milestone followed by static plateau phase, or mixed pattern of loss and delays.[5] Most of the children with autism have features in first year of life i.e. lack of social smile, delay in babbling and vocalization. However, in most cases it comes into notice, when child join school and could not cope with peers.[6]

It has been long thought that autism only manifests as delay in developmental milestones. However recent researches showed that regressive pattern is also a common manifestation of autism. According to one of the metanalysis including 29035 children prevalence of regressive autism was found to be around 32.1%.[7] Most common method for getting information regarding pattern of manifestation is retrospective via parent reports and previous videos. Though more promising method to get information is via prospective studies however they are limited in sample size as 1 in 160 children develop autism. This is useful when recruiting children with siblings having autism as the family history put the children at high risk for autism.[8]

Up to date, regression in autism is a debatable topic. The current study was conducted to find the prevalence of regressive versus developmental delay pattern in autistic children in Pakistan. In Pakistan studies regarding autism are lacking. Few studies have been conducted on autism, however none is performed on regression in autism. Survey by Akhter et al. was conducted on role of parenting, occupational therapy and speech therapy in autistic children.[9] Similarly study by Farrukh et al. was performed on live experience of mothers having autistic children. But did not mention about regression.[10] The study is first of its kind from Pakistan where autism is still a neglected area. Majority of the patients either did not report or are misdiagnosed due to lack of awareness and lack of trained professionals in a country.

MATERIAL AND METHODS

This retrospective study was conducted at Children Department; Pakistan Institute of Medical Sciences after taking Ethical Approval from Children Hospital PIMS. Duration of study was three years from June 2017 to August 2020. Sample size was calculated by using EpiCalc software to estimate for single proportion with keeping confidence interval of 95%, estimated proportion of 0.32 and population of 29035.[7] All children ≤5 years coming first time for assessment of ASD and diagnosed with it on ADI-R and ADOS-2 were included in the study. Total 330 children fulfilled the criterion. Consecutive sampling technique was used. Children were diagnosed according to five modules of ADOS-2. Toddler Module was used for children from 1 year to 2.5 years without speech, Module 1 for children aged 31 months and above with preverbal/single word speech, Module 2 was used for children with phrased speech, Module 3 for children and adolescents with fluent speech and Module 4 for adults with fluent speech. Detailed history including current concerns, past medical history, family history, information about pregnancy and details of early development was taken. Family history was considered positive if any of the blood relatives had ASD or other developmental disorders. Data was analyzed by SPSS v25. Descriptive statistics were performed on qualitative data, dispersion in data was analyzed via mean and standard deviation measurement, relative risk and Odd's Ratio was applied for risk assessment.

RESULTS

Mean age of the children was 4.6 ± 3.88 years with male preponderance (n=255, 77.3%). Ninety-

one (27.6%) of the children had positive family history. Majority of the children had both weight (40.6%) and OFC (80.9%) below 25th percentile (table 1). Regression in milestones was found in thirty-nine (11.8%) of the patients while developmental delay was present in 291 (88.2%) of the children.

TABLE 1: Weight and OFC of children with autism

Percentile	Weight n (%)	OFC n (%)
<25th	134 (40.6)	267 (80.9)
25th - 50th	68 (20.6)	45 (13.6)
50th - 75th	61 (18.5)	8 (2.4)
75th - 91st	42 (12.7)	7 (2.1)
<91st	25 (7.6)	(0.9)

Mean age of the patients with regression in milestones was 4.9 ± 1.96 while those for developmental delay was 4.6 ± 3.50. No significant (T=0.585, p=0.59) was found between presenting age of children with regressive autism compared with developmental delay.

Males were found to have higher risk (OR=6.2, RR=5.4, p<0.01) of regression than females. Fig 1 shows the comparison of pattern of manifestation in males versus females. No significant association (OR=0.89, RR=0.91, p=0.77) was found between regression of milestones and positive family history of disease. Fig 2 shows the comparison of pattern of manifestation in children with positive versus negative family history of disease. No significant association (OR=0.76, RR=0.82, p=0.77) was found between being females and family history of disease. Fig 3 shows comparison between gender and family history of disease.

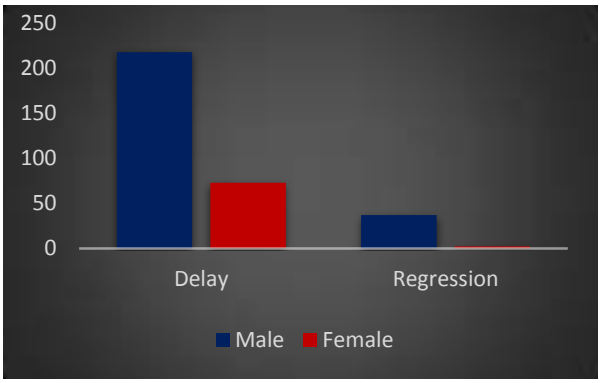

Fig1: Comparison of pattern of manifestation in males versus females

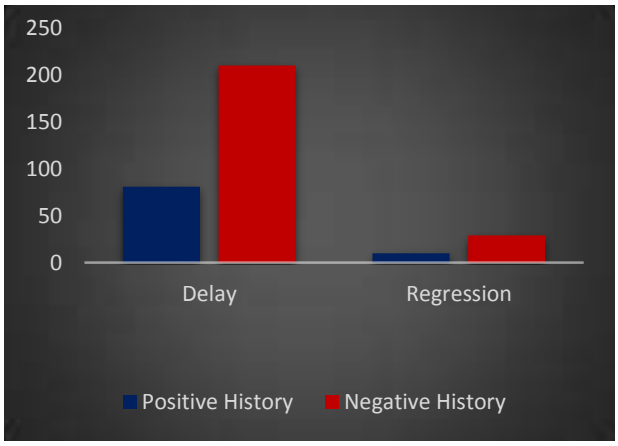

Fig 2: Comparison of pattern of manifestation in children with positive versus negative family history of disease

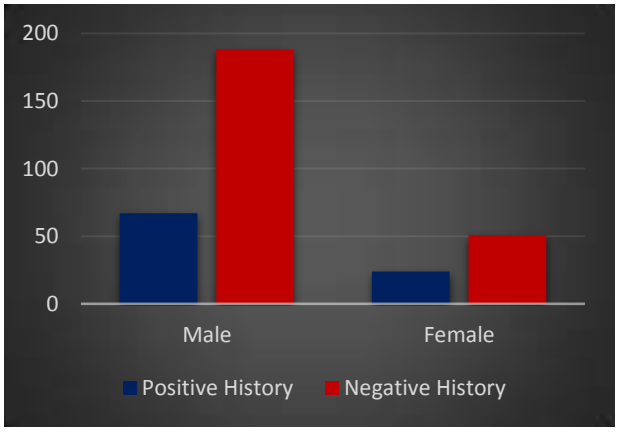

Fig 3: Comparison between gender and family history of disease

No association was found between OFC below 25th percentile (OR=1.29, RR=1.24, p=0.6) and regressive autism. Similarly, no association was found between weight above 75th percentile (OR=0.43, RR=0.48, p=0.06) and regressive autism.

DISCUSSION

Autism was long considered as heterogeneous group of disorders presenting with delay in achievement of developmental milestones and stereotypic behavior. However according to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), Childhood Disintegrative disorder also called as Heller's Syndrome or Disintegrative psychosis was also

categorized under Autism Spectrum Disorder. The Disorder is characterized by regression in previously acquired developmental skills i.e. language, social and motor skills. It usually has late onset with child achieving normal developmental milestones before regression. It mostly occurs after age of three and present as almost complete loss of acquired developmental skills. Loss can be sudden that child may be mindful of it or it can occur over the span of years.[11]

Autistic children with childhood disintegrative disorder or regression pattern have poor prognosis than those manifesting with delay in developmental milestones. Also, they are at higher risk of developing stress disorders including chronic depression, anxiety and obsessive compulsive disorder.[12] Though regression in autism is considered a rare pattern however recent studies are suggesting rise in its prevalence.[13]

It is usually present in one-third (10-30%) of the children with ASD. However this rate of prevalence is usually based on retrospective studies on parents recall memory or videos.[7] Higher rates are reported in prospective studies with regression rate up to 86% in one study. Results of different studies shows wide variations in prevalence rate of regression in autism. This is due to lack of consensus criterion on defining regression and way of taking information regarding loss of skill.[14] In current study, rate of regression was found to be 11.8%. Large Metanalysis by Barger et al showed regression to be present in 30% of the autistic children.[15]

Studies shows that regressive autism usually appear after age of 4 years. This was in concord with our finding where mean age for regressive autism was found to be 4.9 years. However, in current study mean age for delayed pattern was also not much different. This could be due to lack of awareness and stigma associated with developmental disorders due to which parents do not consult physicians and seek medical advice very late.[3]

Underlying genetics on ASD shows that it affects males more than females, this was also seen in current study where male to female ratio was 3.5:1.[16] Study by Zhang et al. on-risk factors for regressive autism showed that males have higher risk of regressive autism than females. In his study males to female ratio was 16:1 compared to non-regressive group i.e. 7:1. This finding was in concord with our study where males were found to have higher risk (OR=6.2, RR=5.4, p<0.01) of regression than females.

Underlying genetics in regressive autism via twin and family studies showed mixed evidence. Though heritability of regressive autism cannot be established, however few mutations have been reported to be found in children with regressive pattern of autism. Our results also showed no significant association between regressive autism and positive family history.[17]

The current study was limited due to its retrospective nature. We recommend to conduct prospective study in future to detect exact rate of prevalence of regressive autism among Pakistani population.

CONCLUSION

Results of current study indicate that regressive autism is not uncommon in Pakistani population which was in concord with studies in other parts of the world. This should be given appropriate consideration if not might result in poor prognosis.

Conflict of interest: Nil

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