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## Integration of therapies in autistic children; a survey based in Karachi, Pakistan

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### Abstract

A cross-sectional study was conducted from January to June 2016 on autistic children at the Autism Unit of Dow University of Health Sciences to compare speech therapy, occupational therapy and combination of both for rehabilitation of autistic children in the selected population. A total of 55 children with autism age range from 1-12 years of both gender and all ethnic groups were recruited. All data was analysed in IBM-SPSS version 23.0. Pearson chi-square test was used to determine association of type of therapy with the diagnosed age of child, gender, mode of delivery, history of vaccination and parent's education. Educated parenthood and a normal behaviour especially by other siblings played a significant role in early detection and referral of autistic child to rehabilitation centre. Moreover, it was observed that a combination of therapies helped in enhancement of social, learning and behavioural skills required for rehabilitation of autistic children.

**Keywords:** Integration of therapies, Autistic disorder, Speech therapy, Parental awareness, Occupational therapy.

### Introduction

Autism is a developmental disability which is defined by changes in the behavioural characteristics of the children. The primary features of autism are difficulties in speech, lack of participation in games and decreased social interaction. Abilities of autistic children vary greatly from one another and that is why it is given the term spectrum of disorder. Its symptoms begin in early childhood with compromised socio-communicative behaviours. In addition autistic children have dysfunction in sensory processing and integration resulting in compromised social and daily activities.<sup>1</sup>

Literature search reveals that 1 out of 110 children suffer from this disorder in the developed countries.<sup>2</sup> In a cross-

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sectional two-phase study conducted in children from 1-10 years of age, a prevalence rate of 0.9/1000 with the highest occurrence of autism in the rural area of Northwest India was observed.<sup>3</sup> Pooled prevalence of childhood autism was 11.8 per 10,000 individuals in mainland China which is lower than estimates from developed countries.<sup>4</sup> In an Indian study it was reported by 80% of participants (psychiatrists, psychologists and paediatricians) about difficulties in the diagnosis of autism.<sup>5</sup>

There is no reliable epidemiological data of prevalence of autism in Pakistan.<sup>6</sup> The awareness of autism is deficient in developing countries including Pakistan.<sup>7</sup> The results of the survey conducted in Karachi reported that more than half of general practitioners had never heard of the term autism.<sup>6</sup>

Occupational therapy, often abbreviated as OT, provides skilled treatment to help individuals for achieving and maintaining independence in development of self-care in all aspects of their lives. OT gives people the "skills for the job of living" like dressing, playing and writing which are required for independent and satisfied lives.<sup>8</sup> OT interventions are based on standardised assessment tests, questionnaires and skilled observations.<sup>1</sup> Occupational therapists design and provide interventions that are effective for the children and can help their families as well.<sup>9</sup> In young children, occupational therapists focus to improve the child's sensory and motor performance, social behaviour, self-care and participation in games whereas in older children it aims to improve the child's social behaviour, and the ability to work independently.<sup>9</sup>

Family physicians and paediatricians are the first medical professionals to whom parents express their concerns regarding the child's development. Families of children with autism have reported that they and their children become socially restricted and isolated.<sup>10</sup> The need for these medical practitioners is to be equipped with more knowledge about autism in order to aid early diagnosis and interventions in autism.<sup>11,12</sup> However, five years of medical undergraduate training in Pakistan does not emphasise on behavioural sciences and has very limited

exposure to childhood psychiatric and developmental disorders.<sup>7</sup> Therefore, we have designed our study with the objective to compare speech therapy, occupational therapy and combination of both for rehabilitation of autistic children in the selected population of Karachi, Pakistan.

## Methodology

A cross-sectional study was conducted from January to June 2016 in the Autism Unit of Dow University of Health Sciences (DUHS). The study protocol was approved by the Institutional Review Board of DUHS and informed consent was acquired from the parents of autistic children. In order to estimate the sample size, we used the available online software at Open Source Epidemiologic Statistics for Public Health (Open epi version 3.01). After inserting 1% prevalence of autism at 2.63% margin of error and 95% confidence interval, we calculated 55 individuals as the sample size for this study.<sup>13</sup> Convenient sampling technique was used and all autistic children with age ranging from 1-12 years of both genders and all ethnic groups were included. A total of 55 autistic children were recruited in the study who were diagnosed by a psychiatrist at the Autism Unit of DUHS or were referred to from other psychiatrists or psychologists with a written report. The response on survey questionnaire (Appendix-I) was acquired from parents of autistic children. Survey comprised of questions regarding: child's age at diagnosis; symptoms; history of viral infections, vaccinations or seizures; and the therapies suggested by the physician. The responsibilities of parents and other autistic children in the family were also inquired from the parents.

The same criteria was used for OT but speech pathologists were also required. Brain stem evoked response audiometry (BERA), is a technique by which brain stem potentials are generated to determine auditory functions.<sup>14</sup> OT was given by helping children who struggle with fine-motor activities, such as handwriting or use of scissors, eating, cleaning, brushing teeth, exercises etc. Occupational therapists worked with children to decrease their fear of being hurt by routine activities like sitting, standing, and walking. They also provided them with training about personal hygiene, dressing, and polishing their grooming skills. Combination of therapies required mixture of both speech therapy and OT.

Data were stored and analysed using IBM- SPSS version 23.0. Pearson chi-square test was used to see the association of type of therapy and diagnosed age of child with gender, delivery status of child, place of diagnosis, vaccination status, parents' educational status, signs the

**(Appendix-I):** Integration of therapies in Autistic children; a survey based in Karachi, Pakistan.

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Questionnaire Date.....

S. No .....

Study ID .....

Referring Hospital .....

Age ..... years

Gender.....

Race.....

Education of father .....

Education of mother .....

**1) At what age did parents notice that there is a problem with their child?**  
.....

**2) What did they notice (symptom)?**  
(a) Delayed speech..... (b) No eye contact.....  
(c) Playing with objects/toys only..... (d) Stomach upset.....

**3) Was it identified by parent or any other?**  
.....

**4) Is there a history of viral infection, vaccinations or seizures?**  
.....

**5) Was the child delivered normally?**  
.....

**6) How much time did you spend to take your child to doctor after noticing symptom?**  
.....

**7) Where did you take your child for diagnosis?**  
.....

**8) What did the doctor say?**  
.....

**9) Did the doctor start any therapy?**  
.....

**10) What was the therapy?**  
.....

**11) How frequently you were called by the doctor?**  
.....

**12) Do you follow the time given by doctor or not?**  
.....

**13) How did you (as a couple) react to the diagnosis?**  
.....

**14) Do you have other autistic children in your family?**  
.....

**15) What is the gender of autistic child?**  
.....

**16) At what age was he/she diagnosed?**  
.....

**17) Have you divided your responsibilities (mother and father) to take care of the child?**  
.....

**18) How do you treat your autistic child?**  
.....

**19) If you have normal children how do they treat autistic child?**  
.....

**20) Which skills are better in your child?**  
.....

**21) Which skills are worse in your child?**  
.....

**22) Does your child have some other problem?**  
(a) Mental retardation  
(b) Down syndrome  
(c) Others .....

---

parents had noticed in their child, and treatments. P-values less than 0.05 were considered significant.

**Results**

The mean age of the study population (55 autistic children)

was 6.27±3.21 years. Fourteen (25%) children were less than 3 years of age, 28 (51%) children were 3 years old, and 13 (24%) children were of more than 3 years of age.

In our study, 42 (76%) boys and 13 (24%) girls were

**Table-1:** Association of therapy with general characteristics.

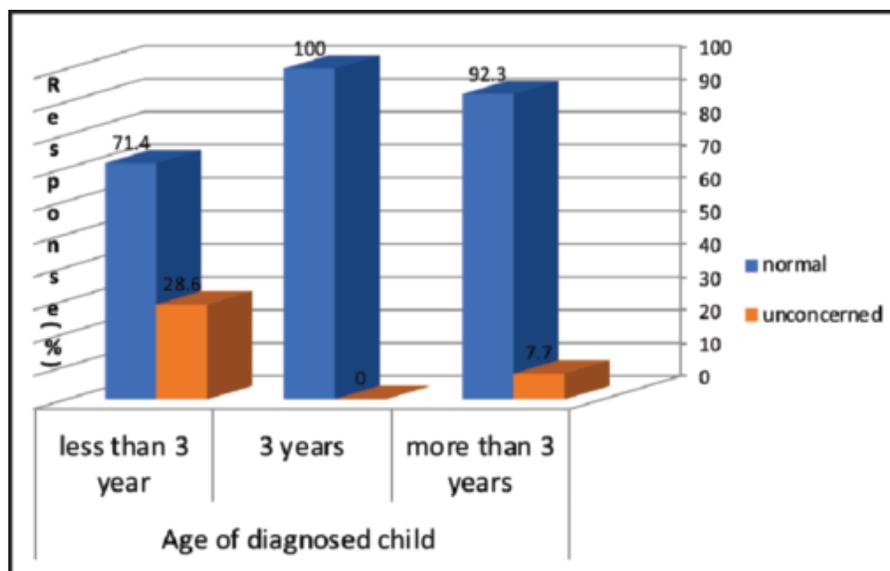
| Characteristics                    |                                    | Type of Therapy (n=55) |      |                            |     |   |      | p-value |
|------------------------------------|------------------------------------|------------------------|------|----------------------------|-----|---|------|---------|
|                                    |                                    | Speech Therapy (n=16)  |      | Occupational Therapy (n=5) |     | Speech & Occupational Therapy both (n=34) |      |         |
|                                    |                                    | n                      | %    | n                          | %   | n   | %    |         |
| Gender                             | Boy                                | 12                     | 75   | 2                          | 40  | 28  | 82.4 | 0.113   |
|                                    | Girl                               | 4                      | 25   | 3                          | 60  | 6   | 17.6 |         |
| Obstetric mode of delivery         | Vaginal                            | 10                     | 62.5 | 5                          | 100 | 15  | 44.1 | 0.048*  |
|                                    | Caesarean section                  | 6                      | 37.5 | -                          | -   | 19  | 55.9 |         |
| Visits to a doctor                 | Once a week                        | 11                     | 68.8 | 2                          | 40  | 10  | 29.4 | 0.199   |
|                                    | Twice a week                       | 1                      | 6.2  | 1                          | 20  | 9   | 26.5 |         |
|                                    | Less than once in a month          | 4                      | 25   | 2                          | 40  | 8   | 23.5 |         |
|                                    | Never                              | -                      | -    | -                          | -   | -   | 5.9  |         |
|                                    | Others                             | -                      | -    | -                          | -   | 5   | 14.7 |         |
| Reaction of the couple             | Shocked                            | 9                      | 56.2 | 1                          | 20  | 13  | 38.2 | 0.180   |
|                                    | Depressed                          | 7                      | 43.8 | 2                          | 40  | 15  | 44.1 |         |
|                                    | Others                             | -                      | -    | 2                          | 40  | 6   | 17.6 |         |
| History of Predisposing Infections | Viral Infection                    | 1                      | 6.3  | 2                          | 40  | 3   | 8.8  | 0.419   |
|                                    | Effects noticed after Vaccinations | -                      | -    | -                          | -   | 1   | 2.9  |         |
|                                    | Seizures                           | 3                      | 18.8 | 1                          | 20  | 2   | 5.9  |         |
|                                    | Other                              | 1                      | 6.3  | -                          | -   | 2   | 5.9  |         |
|                                    | None                               | 11                     | 68.5 | 2                          | 40  | 26  | 76.5 |         |

\*p<0.05 was considered significant using Pearson chi-square test.

**Table-2:** Association of age of diagnosis with type of therapy and other factors.

| Parameters                                |                                    | Age of Diagnosis             |      |                    |       |                              |      | p-value |
|---|------------------------------------|------------------------------|------|--------------------|-------|------------------------------|------|---------|
|   |                                    | Less than 3 years old (n=14) |      | 3 Years old (n=28) |       | More than 3 years old (n=13) |      |         |
|   |                                    | n                            | %    | n                  | %     | n                            | %    |         |
| Type of therapy                           | Speech therapy                     | 3                            | 21.4 | 6                  | 21.4  | 7                            | 53.8 | 0.08    |
|   | Occupational therapy               | -                            | -    | 3                  | 10.7  | 2                            | 15.4 |         |
|   | Both speech & occupational therapy | 11                           | 78.6 | 19                 | 67.9  | 4                            | 30.8 |         |
| Education of father                       | Masters                            | 6                            | 42.9 | 15                 | 53.6  | 3                            | 23.1 | 0.042*  |
|   | Bachelors                          | 6                            | 42.9 | 8                  | 28.6  | 2                            | 15.4 |         |
|   | Intermediate                       | -                            | -    | 2                  | 7.1   | 2                            | 15.4 |         |
|   | Matric                             | 1                            | 7.1  | 2                  | 7.1   | 6                            | 46.2 |         |
|   | Not specified                      | 1                            | 7.1  | 1                  | 3.6   | -                            | -    |         |
| Education of mother                       | Masters                            | 5                            | 35.7 | 9                  | 32.1  | 4                            | 30.8 | 0.14    |
|   | Bachelors                          | 7                            | 50.0 | 11                 | 39.3  | 2                            | 15.4 |         |
|   | Intermediate                       | 1                            | 7.1  | 7                  | 25.0  | 3                            | 23.1 |         |
|   | Matric                             | 1                            | 7.1  | 1                  | 3.6   | 2                            | 15.4 |         |
|   | Not specified                      | -                            | -    | -                  | -     | 2                            | 15.4 |         |
| Treatment of child                        | Normally                           | 10                           | 71.4 | 11                 | 39.3  | 8                            | 61.5 | 0.11    |
| Take more care                            | 4                                  | 28.6                         | 17   | 60.7               | 5     | 38.5                         |      |         |
| Behaviour of other children in the family | Normal                             | 10                           | 71.4 | 28                 | 100.0 | 12                           | 92.3 | 0.01*   |
|   | Unconcerned                        | 4                            | 28.6 | -                  | -     | 1                            | 7.7  |         |

\*p<0.05 was considered significant using Pearson Chi Square test.



**Figure:** Age of diagnosis of autism and behaviour of normal children in the family.

autistic. Obstetric mode of delivery was vaginal for 30 (55%) children, while 25 (45%) were delivered by caesarean section. The association of type of therapies with general characteristics is given in Table-1 which shows that combination of therapies significantly improved outcomes in autistic children who were born by caesarean section ( $n=19$ , 55.9%;  $p=0.04$ ); there was no significant association with any other factor including vaccination history ( $p=0.048$ ).

Table-2 gives the association of the diagnosed age of child with type of therapy and other factors; 7 children (53.8%) of age more than three years had received speech therapy. This study shows that the diagnosed age was associated with the education of the father, age of the child at which parents noticed the signs, and behaviour of normal child with autistic child in family ( $p=0.01$ ). Figure compares the age of diagnosis of the autistic child when there is a normal child in the family.

## Discussion

Autism spectrum disorder affects more than 5 million children in south Asia.<sup>15</sup> This survey-based study provides a brief overview of type of therapy used for children with autism. We aimed to find out the effect of OT on children with autism. These children with autism demonstrated complex behaviours that required the combination of different approaches and methods. The overall goal of OT is to help the children with autism improve their quality of life.<sup>1</sup> Children with autism have deficiency in social communication therefore speech therapy is commonly recommended by speech therapist.<sup>8</sup> Occupational

therapists establish challenging and motivating environment for children which reinforce them to be engaged in an activity.<sup>5</sup>

In our study, the boy to girl ratio was 3:1 which is also supported by Loomes R et al.<sup>16</sup> Our main findings were that all types of therapies contributed towards the improvement of children with autism. Learning skills were improved in most of the children with speech therapy and social skills were improved in most of the children with speech and OT both. The mode of delivery was also an important factor for giving response to different types of therapies. In our study, significant difference was found between vaginally-delivered and caesarean-delivered children; vaginally-delivered children responded more quickly to

any type of therapy as compared to the caesarean-delivered children.<sup>17</sup>

This study also provides information on vaccinated and non-vaccinated children. Previously it considered that vaccination of children leads to the development of autism disability.<sup>17</sup> Our study proved that there is no effect of vaccination on the development of autism.<sup>18,19</sup> This result is supported by Robin P et al who also suggested that there is no association between pattern of onset and receipt of any type of vaccines.<sup>18</sup>

Education of the father played an important role in diagnosis of autism at an early age.<sup>20</sup> In our study, we observed that the father's education helped in diagnosis of autism at an early age; majority of the children were diagnosed with autism at the age of 3 years when their fathers had post-graduate level of education. In Pakistani population, the role of fathers of developing children and those having children with disabilities is very important. Fathers' involvement has increased in recent years and has been supported by the positive influences of fathers on their children's development.<sup>21</sup> We have found significant difference at the age of diagnosis of the child - majority of the autistic children were diagnosed at the age of 3 years (51%). We found improvement in 50 (91%) autistic children with whom siblings behaved normally as compared to those who thought that autism is not a treatable disorder. This is comparable to the study done by Schreibman L et al who also observed improvements in the behavior of the autistic children after behavioural training for siblings of autistic children.<sup>22,23</sup> There is a

need to spread public awareness regarding selection of different approaches of OT, as there are some families who do not feel comfortable in exposing their children in front of others and therefore they do not pursue any kind of therapy for them.<sup>3</sup>

The use of integrated therapies need to be emphasised for autistic children. Furthermore, a programme for the education of parents and training of skills is required for newly diagnosed autistic children in all autistic centres.

One of the limitations of this study is the small sample size and collection of data from one centre with the element of potential bias. However this is the first study in Pakistan which can be used as a stepping stone to generate new data and assist in rehabilitation of autistic children.

## Conclusion

Integration of both OT and speech therapy helped to bring improvement of social, learning and behaviour skills required for rehabilitation of autistic children. Education status of the father, age of diagnosis, mode of delivery and behaviour of other normal children in the family with the autistic child played a significant role in their improvement towards a healthier existence.

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