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ROLE OF DIFFERENT THERAPIES IN THE MANAGEMENT OF AUTISTIC SPECTRUM DISORDER

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ABSTRACT

Autism spectrum disorders (ASD) are a complex group of neurodevelopment disorders characterized by impairments in communication skills, social skills and repetitive behavior. There are varieties of different therapeutic treatment options that are frequently used with people with Autism Spectrum Disorder. In the Clinic Brain Neuropsychiatric Institute & Research Center, Barasat, Kolkata, India, different management approached are taken for the treatment of ASD for betterment of life. These include: psychotherapy, occupational therapy, speech therapy, special education, art therapy, music and movement therapy, animal therapy, etc.Since to date there is no specific medication developed to autism itself, the psycho-pharmacologic approach is addressed to some core symptoms, such as hyperactivity, anxiety, depression, etc. Psycho-pharmacotherapy can eventually improveadhesion to non-medical treatment of ASD patients. Occupational therapists (OT) offer a wide range of therapies for individuals with ASD on the basis of specific deficits and difficulties.In the evaluation and treatment of individuals with ASD, OT professionals tend to address ADLs, IADLs, adaptive behavior, rest and sleep, employment/pre-employment, and social participation.Over the last few decades, speech and language therapy, in particular the direct intervention type - the characteristic of which is the treatment directed to the abilities and inabilities of each child, has been emphasized as a means of social adjustment of communicational behavior. Simulation of the pragmatic level of language is possible in persons with ASD, it must be preceded by targeted diagnostics and assessment of individual components of the pragmatic level of language. Positive teacher attitudes are an important predictor of thesuccessful education of children with disabilities, including those with ASDs.However, the severity and pervasiveness ASD often leads tothe teaching and inclusion of this group of pupils to beseen as especially complex. Expressive Arts Therapy, specifically arts based therapeutic interventions can offer a unique and comprehensive approach to address a variety of the defining symptoms of autism and in doing so, may have the potential to improve relational capacity for those with the disorder. Art therapy can be used to address tactile and sensory integration, communication, emotion and affect regulation, as well as a way to practice social skills and increase the likelihood of bonding. The music-based interventions are effective treatment tools for individuals with ASDs because they harnessthe musical strengths of this population while alleviating their impairments. The music-based interventions particularly attractive for individuals with ASDs.The focus in recent research has shifted from the conventional use of animals for domestication purpose to clinical applications to improvise human well-being. Animal-assisted therapy (AAT) is a type of therapy that involves use of animals in the therapeutic or treatment process, also for the treatment of ASD.

Keywords: Psychotherapy, occupational therapy, speech therapy, special education, art therapy, music and movement therapy, animal therapy.

INTRODUCTION

Autism spectrum disorders (ASD) are a complex group of neurodevelopment disorders characterized by impairments in communication skills, social skills and repetitive behavior (Sagar, 2011).Autism is a neurodevelopment disorder in the category of pervasive developmental disorders, and is

characterized by severe and pervasive impairment in reciprocal socialization, qualitative impairment in communication, and repetitive or unusual behavior. The Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) include Autistic disorder, Asperger's syndrome, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), Rett‟s syndrome, and childhood disintegrative disorder as pervasive developmental disorders (Levy, Mandell and Schultz, 2009).

Autism, a pervasive developmental disorder, is no longer unknown to families across the globe.
With recent statistics from Centres for Disease Control and Prevention (2020), reports indicate that India is home to 10 million individuals with autism. The rate of its occurrence is growing rapidly with one in 88 children born with ASD (Priyanka, 2018).It is estimated that ASD affects one child in every 150 births; other researches on a similar note estimate 6% chances in every 10,000 births. A raising diagnosis of 10-17% each year depicts that it is the fastest growing developmental disability. According to the Center for Disease Control and Prevention (CDC), nearly one in 54 children are diagnosed with Autism Spectrum Disorder each year (CDC, 2020). The number of children with autism has markedly increased world-wide over the last decade among all racial, ethnic and socioeconomic backgrounds.

The leading cause for ASD is genetic. The presence of grand mal seizures and mental retardation provides clear evidence of the biological basis (Sadock and Sadock,2003). Other factors such as immunological factors like damage to the extra-embroyonic tissue during gestation or immunological incompatibility from maternal antibodies that are directed to the foetus also contribute to the development of autism. Perinatal factors like maternal bleeding during first trimester and meconium in amniotic fluid are causal factors. Research also indicates neurogenesis and decrease in neuronal death results in brain enlargement which is mostly noticed in autistic disorder, other biochemical factors such as increased homovarillic acid in cerebrospinal fluid results in pathogenesis of autism (Sadock and Sadock,2003).

Though research has been done and correlations can be made, there is no defined cause of Autism Spectrum Disorder. Initial speculation suggested that autism may have been caused by weak parenting or lack of affection from caregivers, though that has since been disputed. Recently, there has been strong evidence supporting a genetic component to ASD in addition to environmental factors (Holmes, 2020). Research explored within this literature review will combine these theories to look more closely at the biological and social family system and how early social interaction, care taker attentiveness and sensitivity, among other contributing factors, lead to the development of attachment styles in individuals with autism and from there, how therapeutic expressive arts interventions can support and rebuild relational capacity.

MANAGEMENT OF AUTISM SPECTRUM DISORDERS

Autism Spectrum Disorder is a neuro developmental disorder that is characterized by deficits that occur within the domains of social interaction and communication, as well as obsessive interests and repetitive behaviors(American Psychiatric Association, 2013).Majority of children with autism in India have not received a diagnosis or intervention. The lack of early diagnosis can condemn them to a life of difficulty in adjustment due to neglect of their special needs.The rate of diagnosis for Autism Spectrum Disorder has grown exponentially within the last few years. With that has come a need for more comprehensive understanding of the disorder and appropriate tools and methods for treatment (Holmes, 2020).

Individuals with ASD struggle within three main realms of functioning, which include difficulty in social interaction, communication and a tendency to engage in repetitive and self-stimulatory behavior. Individuals with ASD, particularly children, often struggle with sensory experiences; experiencing a severe sensitivity or de-sensitivity to particular auditory, visual and tactile sensations, which can further impede on their ability to engage

and interact with their surroundings (American Psychiatric Association, 2013). Excess sensory input often leads to the exhibition of negative behavior or possible emotional meltdowns for those with autism or sensory processing issues. Due to the nature of Autism Spectrum Disorder, it is a challenge to decipher how and if the deficits of the disorder interact with the development of attachment during infancy and early childhood (Holmes, 2020).

There are varieties of different therapeutic treatment options that are frequently used with people with Autism Spectrum Disorder. Some common approaches include, Applied behavior Analysis (ABA), Verbal Behavioral Therapy (VBT), Cognitive behavioral therapy (CBT), Developmental and Individual Differences Relationship Theory (DIR) and Daily Life Therapy (DLT). These therapeutic models are often used in conjunction with other services such as speech therapy, occupational therapy, physical therapy, sensory integration and expressive arts based therapies (Holmes, 2020).

In the Clinic Brain Neuropsychiatric Institute & Research Center, Barasat, Kolkata, India, different management approached are taken for ASD for betterment of life. These include: psychotherapy, occupational therapy, speech therapy, special education, art therapy, music and movement therapy, animal therapy, etc. In this article, we are emphasising the role of different therapeutic approaches for ASD management.

PSYCHOTHERAPY

The general management of ASD from the clinical perspective encompasses both interventions in the family/environment as well as interventions addressed to the patient. Ideally, after diagnosis confirmation, the best initial approach could be done by an interdisciplinary team including professionals coming from medicine, psychology and social sciences. Since to date there is no specific medication developed to autism itself, the psychopharmacologic approach is addressed to some core symptoms, such as hyperactivity, anxiety, depression, etc. Actually, medication is frequently required to decrease the “noise” surroundingautism, including a wide range of maladaptive behaviors and/or associated problems(Benvenuto *et al.,* 2012). Psycho-pharmacotherapy can eventually improve adhesion to non-medical treatment of ASD patients (Gottfried and Riesgo, 2011).

Obviously, before initiating any kind of intervention, several steps must be done as follows. First of all, the final diagnosis must be confirmed by a careful anamnesis as well double-checked using the DSM-IV criteria as well as a reliable clinical instrument such as Autism Diagnosis Interview-Revised (ADI-R) (Becker *et al.,* 2012).The second step includes the definition of the parent’s doubts, fears, and degree of awareness. Usually, after diagnosis confirmation, parents became stressed. The third step could be the delimitation of environmental variables that needs to be addressed, starting from the home and family. The next step is done by the identification of the target behaviors needing treatment. After core symptoms definition in each case, the different professional specialties that need to be involved are selected (Riesgo*et al.,* 2018).

Treatments for ASD that families pursue include behavioral, educational, medical, allied health, and complementary approaches. Individual goals for treatment vary for different children and may include combinations of therapies (Weitlauf*et al.,* 2014). For many individuals, core symptoms of ASD (impairments in communication and social interaction and restricted/repetitive behaviors and interests) may improve with intervention and over time (Ernst, 2000; Feinberg and Vacca, 2000);however, deficits typically remain throughout the lifespan. Lifelong management - often using multiple treatment approaches - may be required to maximize functional independence and quality of life (Geckeler*et al.,* 2000; Goldstein, 2000).

OCCUPATIONAL THERAPY

Occupational therapists (OT) offer a wide range of therapies for individuals with ASD on the basis of specific deficits and difficulties (Gee*et al.,* 2018).In the evaluation and treatment of individuals with ASD, OT professionals tend to address ADLs, IADLs, adaptive behavior, rest and sleep, employment/pre-employment, and social participation. Underlying these issues, therapists seek to improve performance with

gross motor, fine motor, and visual-motor integration skills; visual perception; sensory processing; and behavioral regulation (American Occupational Therapy Association, 2014). Additionally, the evaluation and treatment process of individuals with ASD includes context (conditions within and surrounding the client) and the environment (external physical and social conditions), activity demands (tools, space, action and performance skills needed) and finally client factors (underlying beliefs, abilities and values). The OT professional takes into account the setting where the services will be provided and the environments where the individual functions and/or plans to function (American Occupational Therapy Association, 2014). Caregivers play a significant role in occupational therapy treatment and are recognized as the 'client' while evaluating the child with ASD. Factors such as socio-demographic characteristics, roles, habits, rituals and the occupational balance of caregivers are to be taken into consideration (Akdem and Akel, 2014; AOTA, 2015).

The specific intervention techniques used in OT with individuals with ASD include; establishing new functional skills, modifying activity demands, creating healthy lifestyles, maintaining existing performance, and preventing future difficulties for clients at risk (Dunn, 2007). One of the hallmark features of individuals with ASD is their tendency towards strong preferences and focused interest. While this tendency may be considered maladaptive for the generation of new skills, the OT may use it to influence the client's self-esteem and motivation to take part in areas of occupation as well as the intervention process through judicious choice of treatment activities that tap into an individual's preferences and interest (American Occupational Therapy Association, 2014).

Occupational therapy interventions, which are designed according to standardized assessment tests, questionnaires, skilled observations, provide considerable advantage in dealing with the problems individuals with autism and their families face in daily life (Bumin*et al.,* 2015).

SPEECH THERAPY

Over the last few decades, speech and language therapy, in particular the direct intervention type - the characteristic of which is the treatment directed to the abilities and inabilities of each child, has been emphasized as a means of social adjustment of communicational behavior. It has also been observed that, when direct intervention is complemented by indirect intervention - in other words, when the therapeutic context and scenario are amplified by guiding the family and school, the process of evolution shows greater speed and extension (Tamanaha*et al.,* 2015).Being caring when dealing with parents, at times providing them with precise information on the child's development, taking in doubts and understanding requests, and, at other times, inviting them to participate as agents of the language process, is an essential task in the child's speech and language therapy.

The outlining of therapeutic conducts of language must consider the participation and the involvement of the family (American Speech-Language-Hearing Association, 2006; Marteleto and Pedromônico, 2005). It is important that parents are able to detect the atypical manifestations in development and create communicational contexts in which the child has effective participation(Charman, 2010; Green*et al.,* 2010; Tamanaha*et al.,* 2008).Taking as a fact that the direct intervention of speech and language therapy, when combined with its indirect intervention, allows for a greater evolutionary pattern of children with autism spectrum disorders – if compared to the implementation of only indirect intervention.

Although simulation of the pragmatic level of language is possible in persons with ASD, it must be preceded by targeted diagnostics and assessment of individual components of the pragmatic level of language (Boyd, 2011). For these purposes, it is necessary to verify appropriate materials that focus on specific areas directly affecting the course of speech-language intervention (Říhová and Vitásková, 2012) but not only from a quantitative perspective.

Communication pragmatics is affected by mutual interaction of the language and cognitive abilities and the quality of the sensorimotor integration (ASHA, 2016). The pragmatic level of language in persons with ASD needs to be considered not only in the context of social behaviour but also motor performance as well as imitation processes and perceptual determinants - sensory skills including orosensory abilities (Miller*et al.,* 2014). Variations in the perception of the pragmatic-oriented communication behaviour can affect the final child assessment in terms of the child's prognosis and functional communication parameters, which are to be stimulated or compensated for in the course of speech-language intervention. The principle of specific speech-language intervention is based on the processes of learning through imitation. Regarding the use of the elements of alternative or augmentative communication (AAC), it is also based on functional communication behaviour, *i.e.* pragmatic language skills (Vitásková and Kytnarová, 2017).

SPECIAL EDUCATION

Positive teacher attitudes are an important predictor of the successful education of children with disabilities, including those with autism spectrum disorders (ASDs) (Robertson*et al.,* 2003; Stanovich and Jordan, 1998).However, the severity and pervasiveness ASD often leads tothe teaching and inclusion of this group of pupils to be seen as especially complex (Simpson*et al.,* 2003). Even teachers of recognized professional competence often consider themselves less ableto deal with these students than with those with any other form of special needs (McConkey and Bhlirgri, 2003; Mavropoulou and Padeliadu, 2000).

Several studies suggest gaps in teacher education, particularly the lack of exposure to curriculum content on the education of students with autism (Barberini, 2016; Schmidt *et al.,* 2016). Not knowing "what" or "how to teach," many of these teachers end up adopting common-sense practices. The schooling of students with autism in regular classes has been challenging, demanding from the teacher the knowledge and the incorporation of effective intervention strategies. Simpson *et al.*(2003) indicated that teachers are prepared to teach students with ASD if this occurs in the context of collaboration with special education teachers and support staff and with other additional resources.

ART THERAPY

Expressive Arts Therapy, specifically arts based therapeutic interventions can offer a unique and comprehensive approach to address a variety of the defining symptoms of autism and in doing so, may have the potential to improve relational capacity for those with the disorder. Art therapy can be used to address tactile and sensory integration, communication, emotion and affect regulation, as well as a way to practice social skills and increase the likelihood of bonding (Holmes, 2020).

As described by Dr. Kiyo Kitahara in her writings on Daily Life Therapy, creativity in music, visual arts and kinesthetic movement is often how individuals with autism best succeed in communicating their feelings, stimulating intellect and as a means of diffusing energy- making. Expressive Arts Therapy an ideal approach to modifying and regulating their behaviors in a positive/strengths based way (Holmes, 2020).

Successful art inventions used in treatment for ASD are focused around sensory integration, the development of emotional literacy and the introduction to appropriate social skills and interaction. Through the use of carefully designed, multi-sensory arts based directives influenced by the Expressive Therapies Continuum (Holmes, 2020), individuals with ASD can be encouraged to fully engage in art activities in a way that promotes affect regulation, as well as bodily and relational awareness. Since social interaction is particularly challenging for individuals with ASD individual, dyad and group formatted treatment can be scaffolded in a way that supports the individualized treatment of each individual. For instance, an art directive can be formatted in a way that begins with individualized creative expression with art materials, where the art product is then used collaboratively within a larger group context. Allowing for the individual with autism to feel comfortable in the therapeutic practice with an

individualized and self-engaged activity before challenging them to broaden their social skill set through group work.

Though a case study, Durani(2019) supported the idea of art therapy as an effective therapeutic tool for aiding individuals with Autism Spectrum Disorder in a variety of ways, the lack of evidenced based empirical research done in the field weakens the overall validity of the data. Miranda D'Amico and Corrinne Lalonde (2017) conducted an arts-based research study to examine the usefulness of art therapy to teach social skills to children with Autism Spectrum Disorder. In their study, arts based interventions were used to "develop self-expression, creativity, and the consolidation of social skills through art making, discussion, play, and collaborative projects" (Damico *et. al.,* 2017).

Those with autism often have difficulty relating to the world around them. Epp(2008) provides a solid overview of what mild to moderate symptoms of autism look like, as well offers a comprehensive look at how group art therapy can address the unique need for social skill development and language/speech acquisition in the autism population. Emery (2004) provides a clear description of how the art making process can help an individual to better understand the world around him by strengthening or developing object constancy. Franklin (2010) provided an interesting perspective on the concept by linking the neurobiological perspective of empathy to art therapy.

Art therapy is viewed as a complementary or adjunctive therapy in the field of autism treatments; its status is equivalent to professions such as music therapy, play therapy, and recreation therapy (Martin and Lawrence, 2009).Treatment approaches used with clients with autism described in art therapy literature include object relations(Evans and Dubowski, 2001), developmental approaches(Emery, 2004), developmental/behavioral approaches(Martin, 2009), and psychotherapy (Henley, 2001; Stack,1998).Art therapy literature contains many sound arguments for and descriptions of the use of art therapy with clients with ASD (Gabriels, 2003; Henley, 2001), but lacks a significant amount of quantitative data, comparison groups, larger subjectgroups, multi-site or replicated studies, studies with adultor adolescent clients, or outcome-based studies.

MUSIC AND MOVEMENT THERAPY

The music-based interventions are effective treatment tools for individuals with ASDs because they harness the musical strengths of this population while alleviating their impairments. Music-based therapies form about 12% of all autism interventions and 45% of all alternate treatment strategies used with in school settings (Simpson *et al.,* 2005; Hess *et al.,* 2008). The majority of the studies focused on addressing the communication impairments inautism. Few studies used musical experiences to facilitate social-emotional and behavioral outcomes in ASDs (Srinivasan and Bhat, 2013). Interestingly, the effects of music therapy on motor performance and motor stereotypies have never been examined. Given the current state of the music therapy literature, it is difficult to make definitive claims about the effects of music-based interventions in children with ASDs, except for the significant treatment effects in improving communication.

The music-based interventions particularly attractive for individuals with ASDs. First, musical training may help address the various core autism impairments in joint attention, social reciprocity, and non-verbal and verbal communication, as well as comorbidities of atypical multisensory perception, poor motor performance, and behavioral problems. Second, children with ASDs find musical activities enjoyable, perhaps due to theirenhanced musical understanding (Heaton, 2003). Children with autism have enhanced pitch perception abilities compared totypically developing children, for instance, enhanced pitch memory, labeling (Heaton, 2003), and discrimination (Bonnel *et al.,*2003). Therefore, clinicians and special educators often usemusic-based activities in school settings to engage children with ASDs (Hess *et al.,* 2008). Third, music-based activities can be non-intimidating experiences wherein a child with ASD spontaneously explores various musical instruments, with the trainer joining in and copying the child's actions.

Musical experiences involving singing, chanting, and playing of musical instruments clearly require communication between individuals. Music and language are closely related to each other in that both music and language are hierarchically arranged, with lower-level units such as notes/keys or letters/syllables integrated to form higher-level units such as chords/chord progressions orwords/sentences (Molnar-Szakacs and Overy, 2006).A recent meta-analysis revealed that active music therapies involving singing and music-making led to significant improvements in verbal communication skills and non-verbal, gestural communication skills in childrenwith ASDs (Gold *et al.,* 2006).

Synchronousmovements during rhythmic actions or music-making as well as unison singing creates a state of social cooperation, sharedpurpose, and a sense of togetherness which sparks a social connection between individuals (Marshet al., 2009; Kirschner andTomasello, 2010).Moreover, group musical environments provide opportunities for learning social skills such as imitation, turntaking/social reciprocity, joint attention, shared affect, and empathy (Overy and Molnar-Szakacs, 2009), which are impaired in individuals with ASDs. While engaging in musical games, children will begin by imitating and synchronizing the actions of asocial partner; however, gradually they will develop an understanding of their partner's intentions and emotions (Overy and Molnar-Szakacs, 2009). Overy and Molnar-Szakacs suggested thatgroup music-making and singing conveys the affective state, physical state, and intentions of the partner and fosters empathy and positive emotions (Overy and Molnar-Szakacs, 2009). This could be particularly important in children with ASDs given their difficulties in empathizing and understanding the intentions of others (Koelsch, 2009). Moreover, different emotions such as happiness, sadness, fear, and anger can be effectively communicated to the listener through musical elements such as tempo and sound level of music as well as intonation and pauses invoice (Katagiri, 2009). Children with autism recognize affective signals conveyed through music, in spite of difficulties in recognizing emotions conveyed through speech (Heaton *et al.,* 1999).

ANIMAL THERAPY

The focus in recent research has shifted from the conventional use of animals for domestication
purpose to clinical applications to improvise human well-being. Animal Assisted Therapy is a
relatively emerging field of study, which uses animals in the form of treatment facilitation (Priyanka, 2018). Animal Assisted Activities(AAA)aimsatenhancingthequalityofh umanlifeand provides opportunity for motivational, educational, recreational and therapeutic benefits. AAA are directed by trained professionals, volunteers or paraprofessionals who work in close association with animals who meet specific criteria for therapeutic assistance. The therapeutic process is generally unstructured, without a specific treatment goal or formally maintained detailed notes. The Delta society is the licensing body for animal interventions (Delta Society,1990).

According to "biophilia" hypothesis, humans have a natural interest towards seeking connection with nature and other forms of life (Sams, Fortney &Willenbring, 2006). Interacting with animals can enhance psychosocial well-being (O'Haire, 2012). Many pet owners have realized the therapeutic effect of nurturing their pets. Animal-assisted therapy (AAT) is a type of therapy that involves use of animals in the therapeutic or treatment process (Goswami, 2012). Currently, there are three organizations in India using AAT based in Bangalore, Mumbai and Pune. A combination of psychiatrists, clinical psychologists, social workers, speech therapists and volunteers are working together to provide this service. The most common animal used for therapy is the dog or a canine, however research has documented the use of rabbits, horses, cats, dolphins, birds, fishes and even donkeys (Priyanka, 2018). AAT can aid in counseling and individual therapy with a client, the same was observed in the therapeutic sessions.

Children with autism increasingly engage themselves in socially appropriate behavior

and demonstrate fewer stereotyped behavior, in the presence of a friendly dog during the session (Redefer and Goodman, 1989). The case study qualitative analysis of use of therapy dogs for children with Autism, conducted by Goswami (2012) in Indian context, showed improvement in social functioning among 3 out of 4 cases.The study conducted by Bass, Duchowny and Labre (2009) showed that autistic children exposed to therapeutic horseback riding exercises exhibited improvements in social functioning and sensory awareness compared to participants who did not receive the treatment.Challenges of this therapy include negative social perception towards animals. Some clients show disinterest towards the animals. Further, more trained volunteers are required for this therapy.

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