



Systematic review of the effectiveness of homoeopathy in the treatment of autism spectrum disorder

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Purpose: Over the years there is a significant increase in Autism Spectrum Disorder (ASD), yet there is no standard medical treatment available for this population. Homoeopathy as reported in literature can prove to be a boon for ASD treatment as in homoeopathy patients are prescribed medicine based on specific symptoms in light of associated physical and mental aspect. A systematic review of literature was required to put together the reported information on the relation between homoeopathy and ASD. This work reviews all the related literature in-depth.

Methods: Literature on the concerned issue was searched from databases like Scopus, PubMed, ScienceDirect, JASTOR, Google Scholar, PsycINFO (psychology and psychiatry literature), and ERIC (Education Resources Information Center).

Results: In total, 19 published articles were found on the investigation of using homoeopathy in the treatment of ASD. Seventeen studies showed that homoeopathy can be effective in the treatment of ASD. Result of 1 study was inconclusive and 1 more study found homoeopathy to be not suitable in treating ASD.

Conclusions: Most reports support the use of homoeopathy in the treatment of ASD. They describe that homoeopathy efficiently control ASD symptoms and also supplements other therapies used in the treatment of ASD. Few authors suggested otherwise too.

Keywords: Homoeopathy, Autism Spectrum Disorder, Treatment, Therapies



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INTRODUCTION

Autism is a developmental disorder of neurological origin that affects normal functioning of the sufferer in the society. They majorly lack social interaction, have verbal and non-verbal communication deficit and show repetitive/limited behavior. Autism mostly erupts in childhood and may change during the course of life [1-6]. Autism differs from person to person in terms of severity and combination of symptoms. Symptoms may range from mild to severe and often change over time [1,2,5].

The term "Autism" was first used by Leo Kanner, an American Scientist in 1943 for describing children who showed reduced social interest [4,7,8]. Since 2013, Autism along with Asperger Syndrome, Pervasive Developmental Disorder-Not Otherwise Specified and Childhood Disintegrative Disorder are grouped under a term "Autism

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Spectrum Disorder (ASD)” by Diagnostic and statistical manual of mental disorder (Version-5) [9]. The term ASD was approved by International Classification of Diseases in its 11th version [10].

World Health Organization (2019) reported global ASD prevalence to be at 1 in every 160 children. In developed country like the United States of America recorded an alarming increase in its prevalence from 1 in 500 children (a decade ago) to 1 in 68 (in 2014) and 1 in 54 (in 2016) [7,10,12]. In developing country like India, it is ranged to be between 0.15% to 1.01% [13,14]. Prevalence of ASD in many low to middle income countries remains unknown.

ASD has shown to have multi-factorial genetic and non-genetic etiologies [5-7,15]. Recent researches have an indicated strong genetic basis of ASD [5-8,15] Sibling with ASD and twins are at high risk of developing ASD. Some non-genetic high-risk factors of ASD are advanced paternal age, intrauterine exposures to teratogenic drugs, birth complications (such as trauma and ischemia/hypoxia) and heavy metal exposure [2,7,15-17]

ASD is usually diagnosed in the first 2-3 years of life as most characteristics of the disorder manifest by that time. In some cases, child develops normally till toddler-age and ASD symptoms emerge thereafter. There is no specific medical test available to diagnose this condition [2]. Diagnostic and statistical manual of mental disorder (Version-5) provided guidelines for the standard diagnosis of ASD and also defined its severity range [8,9]. Clinically, ASD is diagnosed using various developmental and behavioral tools, questionnaires and/or checklists such as Childhood Autism Rating Scale, Gilliam Autism Rating Scale, Autism Behavior Checklist, Autism Spectrum Quotient, Social Responsiveness Scale, Pervasive Developmental Disorder Behavior Inventory, Autism Diagnostic Interview-Revised and Autism Diagnostic Observation Schedule and Autism Behavior Inventory [2,10,18]. Diagnosing ASD is sometimes difficult as it may co-exist with conditions like attention-deficit/hyperactivity disorder, obsessive compulsive disorder, anxiety or depression, or conduct disorder [2].

Autism is a lifelong condition. Management of ASD is very challenging considering the versatility of symptoms, the fact that symptoms may revoke and severity of symptoms may change over time. ASD management involves multidisciplinary approach with the aim to reduce symptoms, improve cognitive ability, communication and daily living skills & to maximize the ability of child to function and participate in the community.

Heterogeneity in terms of symptoms is very high in ASD and as such management of ASD is patient specific. Applied Behavior Analysis, Antecedent-based Intervention, Cognitive Behavioral Intervention, Education of Autistic and Related Communication Handicapped Children, Naturalistic Interventions, Functional Communication Training, Occupational Therapy, Pivotal Response Training, Speech Therapy & Technological-aided Instruction and Intervention are the various management strategies currently available for treating ASD. Depending upon the symptoms one or a combination of many treatments mentioned above are given to the individual with ASD. However, these treatments mainly focus more on communication and sensory issues, academics, behavioral modification and adaptive living [2,10,18].

Talking about the medical management, despite of the advancement in the modern medicine system (Allopathy) there is no 100% cure for ASD. Some allopathic medications are helpful in containing certain ASD symptoms like irritability, aggression, repetitive behavior and hyperactivity. However, there is limitation in the use of allopathic medication for ASD. It comes from the indications that long term usage of allopathic medication, in case of persisting symptoms (which is very common in ASD), may cause side-effects and induce drug-dependency which may not be safe for this population especially when they cannot express their problem [19-21].

Apart from Allopathy, there are several global and country based indigenous medicine systems. Some of them are Homoeopathy (Originated in Germany now practiced globally. It is the second largest used system of medicine after Allopathy), Herbalism, Acupuncture, Ayurveda (Originated in India now practiced globally), Chelation Therapy, Kinesiology, Ozone Therapy, Reflexology, Massage Therapy, Iridology, Unani, (Islamic medicinal system and Chinese Traditional Medicine (Originated and practiced in China). Term “Naturopathy” is the term used to describe them collectively. In literature on the treatment of ASD, there is no mention of any other Naturopathic medicine system in the treatment of ASD except Homoeopathy.

Homoeopathy medicine system was founded by German physician Dr Samuel Hahnemann. Interestingly, Dr Samuel Hahnemann was initially a practitioner of Allopathy and in fact the one who coined the term “Allopathy”. Homoeopathy and its traits are very different from other medicine systems. Homoeopathy medicine system is based on the principle of “Similia Similibus Curentur” which means “Likes Cure Likes”. This is known as “Law of Similia”. Homoeopathy believes on

the existence of vital force which on derangement leads to the development of disease. Correction of deranged vital force can only be possible when a medicine with similar symptoms and strong in nature work on the deranged vital force and produce artificial disease which is similar and stronger than the natural disease, so by the virtue of “Natures Law of Cure” artificial medicinal disease will annihilate the original disease and induce cure. Homoeopathy follows a holistic approach of healing, wherein the physician treats the patient as a whole and select the medicine thorough investigation of physical, mental and behavioral aspect of the individual. This is called “Individualized Holistic Treatment”.

Therapeutic or curative power of homeopathic medicines is evaluated through “Drug Proving”. This is done by administering potentised medicine to the healthy individuals (Provers) of different ages and sex. The curative effect of the medicine is then scientifically analyzed by recording the changes in “Provers”. This is to estimate the effect of remedies on human body. Based on the results of “Drug Proving” medicines are prescribed. Homeopathic medicines act dynamically on the vital force to induce changes, which are similar to those brought about by disease. Thus, to achieve cure, medicines are selected appropriately in a way that disease picture (patients’ symptoms) is similar to medicinal picture.

ASD is presented by versatile symptoms in various domains like social interaction, restrictive behavior, communication, sensory input, memory, sleep and skills. These symptoms are outward presentation of internal derangement of the individual. Homoeopathy works at the dynamic plane of individual and can bring about the cure by annihilation of ASD symptoms. In Homoeopathy, numbers of medicines are available that can help in containing a wide range of symptoms as appear in ASD population. Every ASD child is unique in terms of characteristic symptoms. Specific homoeopathic medicines can be selected after identifying uncommon, rare, peculiar and characteristic symptom of the patient with the help of proper case taking.

At the same time, risk associated with homoeopathic treatment is minimal, as it has no side effects even when used for long. This is because homoeopathic medicines are potentised following the “Law of Minimum” of homoeopathy. This law states that smaller the quantity of homoeopathy medicine higher will be the curative power. Potentisation of homoeopathic drugs is a mathematico-mechanical process. It is done for the reduction of crude, inert or poisonous medical substances by which the dynamic energy, latent in crude sub-

stances, is aroused and liberated for use as medicine. That is why, homeopathic medicines act on the dynamic plane to develop artificial disease which extinguish on itself since the quantity of drug is very small; hence it does not induce any ill effect.

Though, homoeopathy presents strong prospect to treat ASD (based on its treatment traits). Currently the efficacy of homoeopathy in treating ASD is poorly understood. One of the reasons for that being the fact that reports on the treatment of ASD using homoeopathy is limited and scattered. Therefore, to address the gap we reviewed the available literature on this issue in order to highlight the success and limitation of homoeopathy in the treatment of ASD.

METHODS

Literature on the concerned issue was searched from databases like Scopus, PubMed, ScienceDirect, JASTOR, Google Scholar, PsycINFO (psychology and psychiatry literature), and ERIC (Education Resources Information Center). Different combinations of relevant terms and keywords related to ASD and homoeopathic treatment were used as search strategy (Table 1). We also go through the reference lists of all the articles included in this review in order to identify additional studies and reviewed clinical trials related to homoeopathy for ASDs to identify corresponding articles. Inclusion and exclusion criteria of article was adapted from preferred reporting items for systematic reviews and meta-analyses (2009)

Table 1. Terms and keywords used for the literature search

S.No	Terms and keywords
1	Autism
2	Autism spectrum disorder
3	Autistic
4	Homoeopathy
5	Homeopathy
6	Homoeopathic
7	Homeopathic
8	Homoeopathic treatment
9	Homeopathic treatment
10	Homoeopathic medicine
11	Homeopathic medicine
12	Treatment using homeopathy
13	Alternative medicine
14	Alternative treatment

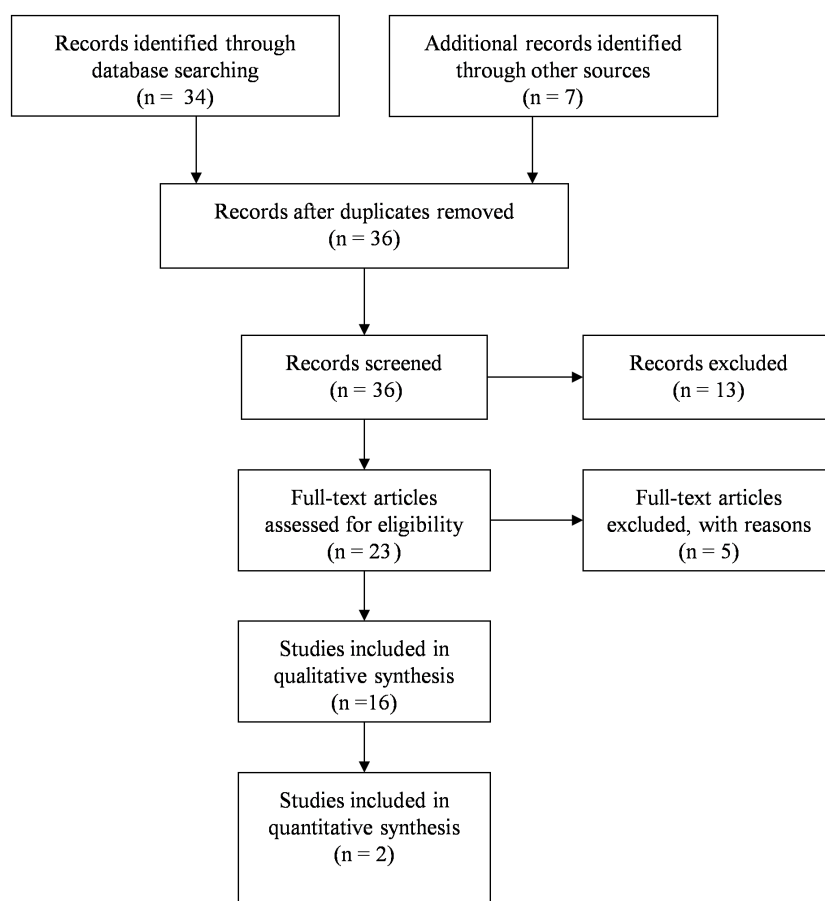


Figure 1. Representation of preferred reporting items for systematic reviews and meta-analyses adopted for selecting articles in this review (adapted from Moher, Liberati, Tetzlaff and Altman 2009).

and represented in Figure 1 [22]. As there were only limited studies on the issue, related information was also collected from health-newsletters, health-magazine and websites of various homoeopathic physicians, caretaker/parents of individuals with ASD and multi-disciplinary professionals involved in the management of ASD.

As mentioned earlier terminologies for this clinical population keep evolving till ICD has standardize it to ASD [which include autism and its less severe conditions such as Asperger syndrome and pervasive developmental disorder not otherwise specified]. In order to avoid discrepancies, in this review we have denote this population using the terms as was used by the authors in their respective reports.

RESULTS

A rigorous literature search on finding the published articles on the issue of understanding the effectiveness of homoeopa-

thy in the treatment of ASD showed the existence of 19 scientific investigation on the issue. Summary of the 19 article and homoeopathy medicines used in the treatment of ASD by respective authors are also mentioned in Table 2. There were 17 reports that support the usage homoeopathy in the treatment of ASD. ASD is a multi-symptomatic disorder and may need intervention from multiple professionals (as mentioned in introduction), these studies suggested that homoeopathy not only was effective in treating the symptoms of ASD but also provide support to the effects of other therapies/treatment/interventions given to ASD. On the contrary, one study suggested otherwise and found homoeopathy to be not efficient in treating ASD. One study was inconclusive in deciding whether homoeopathy was effective or not in the treatment of ASD. Comparative analysis of all the 19 studies is done/shown in Table 3. All the 19 studies are described/elaborated in discussion.

Table 2. Summary of the articles

S.No	Authors	Participants	Results	Medicine used
1	Robinson (2001)	12 adults having autism (Age: 24 to 43 years)	Homoeopathic treatment resulted in the improvement of behavior in some while deterioration in others	Secretin
2	Weber and Newmark (2007)		No supportive evidence to use homoeopathy in autism	Not mentioned
3	Rossingol (2009)		Inconsistent or inconclusive study of any level or studies reporting no improvement	Not mentioned
4	Fonseca, Bolognani, Durão, Souza, Castro, Accioly et al. (2008)	30 ASD children (Age: <7 years)	Positive interference of homoeopathic medication in the cognitive, motor and behavioral performance	Arnica Montana, Thebaicum, Stramonium, Arsenicum Album, Carcinosinum and Natrium Muriaticum
5	Rajlakshami (2008a)	5 autistic children (Age: 4 and 9 years)	Quick recovery in mild autistic children and induce hope of betterment in severe autism following homoeopathic intervention	Belladonna, Lycopodium, Arsenicum Album, Silicea, Calcarea Carbonica, Nux Vomica, Coffea, Staphysagria, Stramonium, Glonoine, Natrium Muriaticum, Hyoscyamus, Kali Carbonicum, Antimonium Tart and Pulsatilla
6	Rajlakshami (2008b)	6 ASD children (Age: 3 to 12 years)	Homoeopathic treatment not only improve the general condition of ASD children but also brings out his latent savant ability	Ignatia, Argentum Nitricum, Hyoscyamus, Tuberculinum, Cautiscum, Pulsatilla, Staphysagria, Silicea, Kali Carbonicum, Coffea, Sulphur and Stramonium
7	Rajlakshami (2011)	A case study	Homoeopathic remedies work very well	Calcarea Carbonica, Silica, Lycopodium and Nux Vomica
8	Rajlakshami (2015)	4 cases. First and 2nd case had ASD with ADHD and Rett syndrome, respectively. Third with Pervasive Developmental Disorder- Not Otherwise Specified and 4th with severe autism.	Homoeopathic treatment has accelerated the process of recovery and optimizes the effects of speech therapy and occupational therapy	Pulsatilla, Belladonna, Lycopodium, Calcarea Carbonica, Silicea, Sanicula, Zincum Met, Natrum Carbonicum and Manganum Aceticum
9	Rajlakshami (2016)	6 case studies of ASD children	Positive effect of homoeopathy	Argentum Nitricum, Lycopodium, Pulsatilla, Silicea, Kali Carbonicum and Stramonium
10	Rajlakshami (2018)	40 ASD children	Significant post-homoeopathic treatment improvement in autistic conditions	Pulsatilla, Silicea, Lycopodium, Agaricus, Belladonna, Staphysagria, Nux Vomica, Sepia, Calcarea Carbonica, Zincum Metallicum, Stramonium, Glononine, Arsenic Album, Natrum Muriaticum, Calcarea Phosphoricum, Nux Moschata, Colocynth, Hyoscyamus, Lac Caninum, Coffea, Bacillinum, Natrum Sulph, Aethusa, Kali Brom, Kali Carbonicum, Hepar Sulph, Natrum Carbonicum and Argentum Nitricum
11	Gupta, Saxena, Malhotras and Juneja (2010)	25 autistic children (Age: 4 to 14 years)	Homoeopathic treatment resulted in significant improvement in 60% of mild to moderate autistic children and 38% of severe autistic children	Belladonna, Hyoscyamus, Vertrum Album, Kali Brom, Phosphorus, Silicea, Bufo, Sepia, Calcarea Phos, Sulphur, Baryta Carbonica, Tuberculinum, Coffea, Kali Phos, Thuja and Passiflora

(Continued to the next page)

Table 2. Continued

S.No	Authors	Participants	Results	Medicine used
12	Gupta, Saxena, Juneja, and Malhotra (2011)	10 ASD children (Age: 9 to 14 years)	Marked improvement was reported after using homoeopathy	Belladonna, Hyoscyamus, Vertrum Album, Kali Brom, Phosphorus, Silicea, Stramonium, Bufo, Sepia, Calcarea Phos, Sulphur, Baryta Carbonica, Tuberculinum, Coffea, Kali Phos, Thuja, Hepar Sulph, Zincum Metallicum, Tarentula, Ignatia, Carcinocin and Lachesis
13	Gupta, Saxena, Juneja, and Malhotra (2013)	4 ASD children (Age: 5–10 years)	Effective control in behavioral ASD symptoms by giving two sets of homoeopathic medicines	Phosphorus, Thuja, Sulphur, Silicea, Calcarea Phos, Tuberculinum, Santoninum, Calcarea Carbonica, Veratrum Album, Tuberculinum, Belladonna, Bufo Rana, Hyoscyamus, Tarentula and Natrum Muriaticum
14	Gupta (2015)	10 ASD children (Age: 9 to 14 years)	Strong effectiveness of homoeopathic treatment in ASD	Belladonna, Hyoscyamus, Vertrum Album, Kali Brom, Silicea, Stramonium, Bufo, Sepia, Calcarea Phos, Sulphur, Baryta Carbonica, Tuberculinum, Coffea, Kali Phos and Thuja
15	Barvalia (2011a)	92 autistic patient	Statistical lowering of autistic load following homoeopathic interventions	Borax, Cocculus, Nux Vomica and Stramonium
16	Barvalia (2011b)	A case study	Homoeopathic treatment was successful	Carcinosinum, Stramonium, Hyoscyamus, Nux Vomica, Tarentula, Phosphorus, Tuberculinum, Natrum Mur, Opium, Borax, Veratrum Album, Calcarea Carbonica, Medorrhinum, Cina, Lyssin, Plumbum Met, Iodum, Lachesis, Mercurius Solubilis and Syphillinum
17	Barvalia, Oza, Daftary, Patil, Agarwal, and Mehta (2014a)	60 autistic children (Age <12 years)	Significant improvement in behavioural dysfunction, sensory impairment, communication difficulty, cognitive ability and hyperactivity following homoeopathy	Carcinosinum, Stramonium, Medorrhinum, Nux Vomica, Lyssin, Lachesis, Zincum Metallicum, Hyoscyamus, Veratrum Album, Tuberculinum Bovinum, Cina, Tarentula Hispanica, Baryta Carbonica, Phosphorus, Calcarea Carbonica, Silicea, Natrum Muriaticum, Calcarea Silicate, Opium, Lycopodium, Causticum, Natrum Phosphoricum and Plumbum Metallicum
18	Barvalia (2014b)	2 autistic children (Age 5 to 9 years)	Sequential administration of homeopathic medicines, following the principles of Organon, can bring about improvement in autistic features	Tarantula Hispanica, Tuberculinum, Stramonium, Natrum Phosphoricum, Lyssin And Carcinosisin
19	Smits (2011)	A case study	Positive effect of homoeopathy	Not mentioned

DISCUSSION

Dr. Paul Herscu and Dr. Amy Rothenberg (naturopathic physicians with specialty in classical homoeopathy) have extensively illustrated homoeopathy treatment in ASD [23-27]. Dr Herscu as cited in [25] emphasized on the treatment of autistic patients with homoeopathy based on three reasons. First is the ineffectiveness of conventional psychotic medicine used

in the treatment of autism. These medicines only calm the patients but do not cure. Second comes from his clinical experience, according to which he says that accurate homoeopathic treatment takes the case in right direction. In addition, the degree of autism does not correspond to the degree of the cure which means that mild cases may receive only partial benefit while some severe cases may get greatly improved with homoeopathic treatment. Third is the evidence of supplementen-

Table 3. Comparative analysis of the studies included in this review

Studies that found homoeopathy to be effective in the treatment on ASD	Studies that found homoeopathy is not effective in the treatment on ASD	Inconclusive studies
1. Robinson (2001)	1. Weber and Newmark (2007)	1. Rossingol (2009)
2. Fonseca, Bolognani, Durão, Souza, Castro, Accioly et al. (2008)		
3. Rajlakshami (2008a)		
4. Rajlakshami (2008b)		
5. Rajlakshami (2011)		
6. Rajlakshami (2015)		
7. Rajlakshami (2016)		
8. Rajlakshami (2018)		
9. Gupta, Saxena, Malhotra and Juneja (2010)		
10. Gupta, Saxena, Juneja and Malhotra (2011)		
11. Gupta, Saxena, Juneja, and Malhotra (2013)		
12. Gupta (2015)		
13. Barvalia (2011a)		
14. Barvalia (2011b)		
15. Barvalia, Oza, Daftary, Patil, Agarwal and Mehta (2014a)		
16. Barvalia (2014b)		
17. Smits (2011)		

tary (positive) effect of homoeopathic treatment on other therapies (such as speech therapy, sensory integration therapy, diet and nutrition) given to manage autistic patients. Dr Herscu reported that proving of alcoholus medicine in the treatment of children with autism and found its good effect [23-25].

Herscu and Rothenberg [24] demonstrated “Cycles and Segments” model and elaborated its clinical application in the treatment of children and adults suffering from pervasive developmental delay and autism. This model concentrates on focused case taking, efficient case analysis and integrated study of materia medica in concise way. Rothenberg [26] discussed a tool “Map of Hierarchy” in the treatment of Autism through a case study. Map of Hierarchy aids in the selection of medicine and monitor the progress of patient. Surprisingly, Dr Herscu and Dr Rothenberg did not undertake any experimental study so far in spite of their vast clinical practice of treating ASD patients with homoeopathic medicine.

According to Opioid Excess Theory, peptides formed due to in-complete digestion of certain foods induce morphine-like activity which may manifest as symptom of autism when concentrated in brain [28]. Secretin, a duodenal enzyme aids in the metabolism of peptides, was found to reduce this activity

and useful in bringing down the autistic features [29]. Robinson [30] prescribed secretin based on the “Opioid Excess Theory” and reported its effects in 12 adults having autism (Age: 24 to 43 years). Pre- and post-treatment Childhood Autism Rating Scale (CARS [31]. Scores suggested improvement of behavior in some while deterioration in others. He also suggested undertaking a study comparing Placebo vs Secretin.

Shalts [32] claimed that homoeopathy work for autistic children when prescription is based on individualization and integrated with other therapies such as cranial therapy, sensory integration techniques, occupational therapy, and behavioral therapy. On the contrary, Weber, et al. [33] found no supportive evidence to use homoeopathy in autism while reviewing the use of complementary and alternative (CAM) treatment such as craniosacral therapy and other manipulative therapies, Reiki and other energy medicine modalities, biofeedback, and traditional Chinese medicine in ADHD and autism. However, there was no elaboration specific to homoeopathy. Rossingol (2009) has mentioned homoeopathic treatment as D-grade (troublingly inconsistent or inconclusive study of any level or studies reporting no improvement) just on the basis of the conclusion made by Robinson (2001) [30,34]. He was reviewing various treatment modes for ASD. In my view, these

conclusions on the use of homoeopathy in the treatment of ASD are inappropriate as they weren't based on any scientific investigation or adequate research evidences.

Fonseca, et al. [35] conducted a study on thirty children with autism (Age: <7 years). Homoeopathic remedies were prescribed on the basis of symptom-similarity. They used medicines in 30C or 200C potency and integrated organo-therapy (a modality of isopathic treatment in which diluted and agitated homologous human body tissues are used to correct dysfunctions) to homoeopathic treatment in order to amplify its action and the field of operation. Psycho-Educational Profile-Revised [36] was used for the pre- and post-evaluation of cognitive, motor and behavioral performance in autistic patients. Results suggested a positive interference of homoeopathic medication in the cognitive, motor and behavioral performance (decrease in aberrant behavior & better social and familiar integration) of autistic children. They further stressed on the early and longer use of medication for better outcome

Rajlakshmi (2008a; 2008b; 2011; 2015; 2016; 2018) has done elaborative work on understanding the effectiveness of homoeopathic treatment in ASD [37-42]. In 2008a, she used homoeopathic medication in 5 autistic children (Age: 4 and 9 years). She prescribed homoeopathic medicine specific to the child using classical homoeopathic approach. Autism Treatment Evaluation Checklist was used for assessing child before and after the treatment [43]. Post homoeopathic treatment she found reduced hyperactivity, anxiety and temper-tantrums & improved emotions, attention span, tolerance, motor skills, sleep pattern, social behavior and communication skills in children with autism. She concluded that homoeopathic treatment brings quick recovery in mild autistic children and induce hope of betterment in severe autism. In a similar study, Rajalakshmi [38] selected 6 autistic children (Age: 3 to 12 years), out of them, 4 were categorized as high functioning autism and rest 2 as low functioning autism with associated mental retardation. She found 200C potency to be best suited to these children as they responded very well and faster without any homoeopathic aggravations. She also insisted on early initiation of treatment for better results. Autistic children were assessed with the help of Autism Behavior Composite Checklist and Profile [44]. Savant skills (special skill or abilities) disappeared once they start to speak or with improvement in other skills. Author hypothesized that homoeopathic treatment not only improve the general condition of autistic children but also brings out his latent savant ability. However, fur-

ther research is needed to establish this fact. Rajlakshmi [39] elaborated a case study of autistic child and suggested that in some complicated cases homoeopathic remedies work very well.

Rajlakshmi [40] investigated the potential of homoeopathic treatment along with other interventions like occupational and speech therapies given as part of multidisciplinary approach to manage ASD. First and 2nd case had ASD with ADHD and Rett syndrome, respectively. Third was diagnosed with Pervasive Developmental Disorder-Not Otherwise Specified and the 4th with severe autism. Out of these four cases, three were non-verbal and one had no meaningful speech. Children were given single homoeopathic remedy after individualization of the patient. Speech, language and communication skills, sociability, sensory/cognitive awareness, health/physical and behavioral issues of each case were compared one year after the homoeopathic treatment using ATEC. Significant positive changes were reported in each domain. She concluded that homoeopathic treatment has accelerated the process of recovery and optimizes the effects of speech therapy and occupational therapy. She also suggested that the direction of homoeopathic treatment should be from intellectual/cognitive domain to the emotional and from the emotional to the physical.

Rajlakshmi [41] evaluated the role of homoeopathic treatment in conjunction with neuropsychological therapies in the management of ASD. She summarized six case studies of ASD children who have shown improvement in the area of sensory dysfunction, behavior, procedural memory and communication skills with homoeopathic treatment. She observed that homoeopathic treatment fastens the process of learning skills and sensory integration. Additionally, she found that homoeopathic treatment reduced temper tantrums and aggressive self-injurious behaviors such as head banging. Rajlakshmi [42] reported descriptive case studies of 40 ASD children in which she adopted similimum approach to prescribe homoeopathic medicine. On comparing pre- and post- treatment ATEC scores, significant improvement was found in ASD children. In this study she also reviewed the academic performance of these children and stressed that homoeopathic medicines helped them in reaching optimal level of scholastic functioning and in turn integrate them into the mainstream. The various studies reported by Rajalakshmi have shown good effectiveness of homoeopathy in the treatment of ASD. She has adopted different types of methodology in her investigations; this strengthens the reliability, validity

and generalization of the results she presented.

Gupta, et al. (2010, 2011, 2013, and 2015) & Barvalia, et al. (2011a, 2011b, and 2014a) are other investigators who have done significant work on understanding relation of homoeopathy and ASD [45-51]. Gupta, et al [45] conducted a study on 25 autistic children (Age: 4 to 14 year) to assess the effectiveness of homoeopathic medicines in the treatment of ASD. Authors developed an Autistic Children Psychological Analysis Assessment questionnaire for the assessment of autistic symptoms at the start and end of 18 months homoeopathic treatment. They selected 7 parameters for psychological assessment and 10 parameters for clinical assessment of symptoms in autistic children. On the basis of the severity of symptoms, they categorized the autistic children into two groups- group A and group B. Autistic children of severity from mild to moderate degree (group A) were given single homoeopathic medicine as per classical approach while severe autistic children (group B) were prescribed with frequently repeated multiple homoeopathic medicines. Significant improvement was found in 60% of mild to moderate autistic children and 38% of severe autistic children. Their results also showed high potencies (1 M, 10 M) to be more effective when sensory symptoms were prominent and low/moderate potencies (30C, 200C) when physical symptoms (such as fidgety, involuntary soiling of clothes etc).

Gupta, et al. [46] studied homoeopathy in 10 ASD children (Age: 9 to 14 years). This time they prescribed them a set of constitutional and intercurrent or complementary homoeopathic medicines as per symptoms and effectiveness. CARS and Autistic Children Psychological Analysis Assessment questionnaire were used to assess the treatment progress of the autistic children. Results were found to be encouraging as there were marked reduction in autistic features and significant improvement in specific behavior.

Further, et al. [47] reported effective control in behavioral ASD symptoms by giving two sets of homoeopathic medicines, constitutional and miasmatic, selected on the basis of specific symptoms of 4 ASD children (Age: 5-10 years). The study demonstrated significant improvement of autistic behavioral and social symptoms as per the analysis of CARS and Vineland Social Maturity Scale Test (Singh, Pandey and Agarwal, 2019). Similarly, Gupta [48] suggested effectiveness of homoeopathic treatment in 10 ASD children (Age: 9 to 14 years).

Barvalia [49] 92 autistic patient on the basis of dominant symptoms; 60 and 32 patients were studied with respect to

cognitive ability and sensory issues, respectively. He found statistically lowering of autistic load in both the groups following homoeopathic interventions through sequential use in a judicious way. Barvalia [50] illustrated homoeopathic treatment of an autistic child in details. Barvalia, et al. [51] demonstrated significant improvement in behavioral dysfunction, sensory impairment, communication difficulty, cognitive ability and hyperactivity in 60 autistic children (Age < 12 years). Barvalia [51] has given illustration of 2 cases with the demonstration of homoeopathic approach in management of ASD. In all the studies of Mr. Barvalia, assessment and comparison of the treatment response was evaluated using ATEC, CARS, Social Quotient scores (calculated through Vineland Social Maturity Scale) and Autistic Hyperactivity Scale (as cited in Barvalia, et al. 2011a, 2014a) [49,51].

In addition to the model and tool developed by Dr Hersu and Dr Rothenberg (mentioned earlier) there are other homoeopaths who have developed certain specific treatment approaches for ASD, for example, CEASE Therapy and Sine wave method. Dr Tinus Smits [52] suggested a new approach "Complete Elimination of Autism Spectrum Expression therapy" (CEASE therapy) to treat ASD. CEASE therapy is developed using the concept of isotherapy which involve step-wise prescription of homoeopathic medicine based on the all the assumed causative factor of autism. In addition, he also advised to provide orthomolecular medicine (such as magnesium, vitamin C, zinc, fish oil, etc.) in order to support healing process. A case study of Pervasive Developmental Disorder-Not Otherwise Specified showing positive effect of CEASE therapy was reported [53].

Kantor [54] highlighted possible difficulty in using classical homoeopathy alone for the multifactorial condition like autism and introduced Sine wave method to cure autism with homoeopathy. This method offers a wide range of tools which contains prevailing homoeopathic approaches and other (than homoeopathy) remedies including lanthanides, gases, gem essences, meditative proving remedies, color and sound remedies & traditional Chinese medicine. Its effectiveness was demonstrated through 8 case studies. However, the tool described by Kantor is not yet reported and/or validated by others.

CONCLUSION

In this review we have mentioned the various approaches, models and tools adopted by different homoeopathic physi-

cians around the world to treat ASD. All these have pointed out a definitive role of homoeopathy in the treatment of ASD. Research investigations, though limited, suggested the same. However, the quantum of research done in the area doesn't match the increasing ASD population. It makes it necessary to undertake in-depth studies about the issue with a strong methodology including large sample size and reliability check.

CONFLICT OF INTEREST

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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