INTRODUCTION

In the etiology of pervasive developmental disorders (following the DSM-5 classification – autism spectrum disorder, ASD), genetic and biologic factors play an important role. With regard to autism, environmental factors such as teratogenic and perinatal impairments may also prove significant. Additionally, it cannot be excluded that a particular child’s possessed psychological factors which in coinciding with other genetic predispositions, may be of some importance in the etiology of autism [4].

The disorder is characterised by deficits in the areas of social and emotional functioning, as well as in the verbal and non-verbal communication strategies important in social interactions. Moreover, within the afflicted, difficulties arise in developing and maintaining relations in various contexts. Furthermore, the presence of repetitive, stereotypical patterns of behaviour and interests is evident. Of note, individuals with autism often display impaired recognition and understanding of, and, hence, have difficulty reacting to, other people’s emotional states (their thoughts, convictions and intentions) [6]. Research demonstrates that early intervention (timely therapy) results in the improvement of the state of individuals affected by autism [11]. According to the estimates of the Center for Disease Control and Prevention in the USA, an average of 1 out of 68 children has ASD [5]. This article offers a survey of selected treatment methods currently discussed in world literature which have a particularly positive impact on the functioning of children with ASD.
MATERIALS AND METHODS

The utilised literature was obtained by web-searching in 2014, the articles found in the Medline resource website. In the search strategy, the following keywords were employed: “ASD”, “autism”, “therapy” and “pharmacological treatments”. We then selected and critically reviewed the most relevant 4 studies.

RESULTS AND DISCUSSION

A hallmark characteristic of individuals with ASD, is the impairment of mutual social interactions. This may have an impact on a variety of areas of functioning, including verbal and non-verbal communication, imitation and developing age-appropriate emotional relationships. In successfully dealing with ASD, it is, therefore, important to introduce therapeutic methods contributing to the accurate recognition of a range of emotions, and which include peer-group activities. One of the techniques described by Corbett et al. (2014) [2] which considerably influences the acquisition of significant social skills (such as peer and other interactions), is the new programme Sense Theatre. This engages healthy peers in the therapy.

Acting is an interactive process encompassing many aspects of socialising, namely observation, perception, interpretation and expressing thoughts and ideas. An actor has to, for example, pay attention to other participants, listen and respond to their signals, as well as to the thoughts and feelings they express. Acting, therefore, involves empathy and intentions, both of which are significant and problematic elements evidenced in ASD affected individuals. What is more, as an actor has to become familiar with the character he or she portrays, with the feelings and convictions displayed therein; the process leads to the broadened awareness of, and the improved familiarity with the experiences of other people. Thus, through acting, ASD-affected children can develop a deeper insight into, and a greater possibility of attributing the mental states of others onto themselves. Indeed, studies show that incorporating various theatrical methods considerably improve the relevant areas of functioning such as empathy and perspective-taking. The Sense Theatre programme applies varied acting techniques like role-playing, scripts and improvisations which provide ASD-affected participants an opportunity to explore and identify subtle and problematic autistic symptoms, as well as ASD, show improvement in the behavioural area due to the neuro-regulation of relevant brain structures.

Solomon et al. (2014) [10] describe a programme dedicated to young children with ASD called ‘Play and Language for Autistic Youngsters (PLAY) Project Home Consultation’. It is intended for children aged 2–8 year old. In the project, trained consultants seek to support the parent-child relationship by means of an organised approach involving coaching, modeling, applied methodology and learning games, supplemented with the use of video material. PLAY consultants visit each family once a month for 3 hours, of which, 15 minutes is devoted to video games and play; then the influence of the undertaken play and applied effective methodological approaches is analysed with the parents. During the visits, the trained consultants provided parents with help in identifying subtle and problematic autistic symptoms, as well as ways of initiating appropriate treatment and remedial action in order to achieve improvement. The play activity is tailored both to the individual child and to the child’s stage of development.

The analysis includes the ‘PLAY Plan’, which delimits the approaches, defining techniques and activities contributing to providing parental opportunities and skills in effectively supporting their child’s functional development. Of note, generally, 12 months after launching the programme, a substantial stress levels reduction in the guardians of ASD-affected children, as well as the alleviation of depression symptoms are usually observed.

A number of papers reveal that dietary treatment [8], supplementation by omega-3 acids [1] and exclusion of some nutrients (gluten-free and milk-free diet) [7] have an effect on ASD prognosis. Among such papers, the highly
interesting research carried out by Singh et al. (2014) [9] relates to administering sulphoraphane (isothiocyanate), a substance derived from broccoli and other cruciferous vegetables.

Singh et al. note that sulphoraphane counteracts many biochemical and molecular disturbances related to autism, among these being oxidative stress and restrained antioxidant capacity, glutathione synthesis defects, mitochondrial dysfunctions and low oxidative phosphorylation, increased lipid peroxidation and neuro-inflammation. Although it is not clear whether the abnormalities result from the etiology of the disorder or rather these are secondary symptoms, Singh et al. demonstrate that correcting the abnormalities often improves behaviour in ASD cases.

The work of Singh et al. reveal that sulphoraphane can ameliorate many unrelated genetic disorders by activating the ‘stress proteome’ which regulates a number of aforementioned damaging processes. Moreover, sulphoraphane, as well as hydroxyurea, phenylbutyrate and trichostatin A show therapeutic potential towards re-establishing regular cellular homeostasis in many unrelated genetic disorders. As the researchers highlight, sulphoraphane is a phytochemical. Isothiocyanates such as sulphoraphane occur in the plant in the form of precursors, the so-called glucosinolates. Sulphoraphane is released when its precursor, glucoraphanin undergoes the hydrolysis induced by myrosinase – an enzyme co-occurring with glucosinolates in cruciferous vegetables.

Depending on the purpose, sulphoraphane can be approved for use as a diet supplement or medication. Thus, it is rightly believed to be a well-tolerated substance of low toxicity. Furthermore, sulphoraphane was shown to produce an effect similar to that of an acquired fever within the organism. Numerous studies indicate that fever can temporarily alleviate the disturbed behaviour in many autistic patients. It is worth noting that the level of enhancement (usually of stereotypical behaviours and communication disorders) was related to the presence of a higher fever among subjects with autism.

In the conducted research, sulphoraphane was administered to men (n=29) diagnosed with moderate and serious ASD (doses were relevant to the subject’s weight and amounted to 9–27 mg). After 4, 10 and 18 weeks from start of treatment, and 4 weeks after completing therapy, the results, when compared to the placebo group, demonstrated an improvement of behavioural symptoms. The enhancement lasted until the treatment was discontinued.

The study results have been compared by way of the use of the Clinical Global Impression scale. This revealed that 46% of the participants who have been receiving medication, noticeably improved their social interaction skills, while 44% ameliorated their abnormal behaviours such as irritability, repetitive movements and hyperactivity, and 42% made progress in verbal communication. Hence, it can be said that the group receiving sulphoraphane exhibited improvement in social interactions, and in emending disturbed behaviour and miscommunication. Unfortunately, the positive changes disappeared after the treatment was discontinued.

The multifactor etiology of ASD should be the point of departure for many methods and forms of therapies followed in therapeutic programmes. It is for this reason that subsequent research is needed to better understand the etiology of autism spectrum disorder and to elaborate more efficient intervention methods for the best therapy results [11]. It is noteworthy that an early diagnosis and the introduction of a multimodal therapy (speech therapist, psychologist, teacher) and dietician) which would involve innovative approaches, can substantially improve the prognosis of individuals with autism spectrum disorder.

CONCLUSIONS

1. In the light of current research, there is no one versatile treatment for ASD-affected children.
2. Due to the higher incidence of ASD in recent years, it is important to investigate its origins, as well as to seek and implement new innovative methods of therapy for individuals with autism spectrum disorder.
3. Despite lacking evidence of their alleviating effects on autism symptoms, the therapeutic and pharmacological treatments necessitate further research to ascertain their efficiency.

REFERENCES