

# The Role of the General Practitioner in Diagnosing and Treating Dyslexia, Dysgraphia and Dyscalculia

## Il ruolo del medico di famiglia nella diagnosi e nel trattamento dei DSA

**Katalin Andrea Gergely** / Hungarian Dance Academy, Budapest, Hungary / katalinandrea.gergely@gmail.com

**Renata Lakos** / Eötvös Lóránd University, Budapest, Hungary / lakos.renata@gmail.com

Pediatricians play an important role in the diagnosis and therapy of children with dyslexia, dysgraphia or dyscalculia. These syndromes strongly affect the performance of children at school. Children with dyslexia, dysgraphia or dyscalculia show a significant underachievement in reading, writing or counting and their failure to meet the school requirements undermines their self confidence and positive self-concept. As a result, children with learning problems often become aggressive, frustrated or play the clown in the classroom. According to the Hungarian law, children with any learning difficulties have the right to get special education by their specific symptoms. In the realisation of the law and equity the pediatrician's expertise is essential and has an important role in the therapeutical procedures. However, the pediatrician's role is more complex than writing an opinion. Pediatricians can help by giving a detailed description about these syndromes and explain them how they can help their child, what the main difficulties during the child's studies are, what kind of therapies can be efficient and how they can make their child's school years easier. During the assessment most of the parents ask the following questions: What does dyslexia, dyscalculia or dysgraphia exactly mean? Is it a handicap or a learning difficulty? Could the child live a normal life? With the proper answer and with an inclusive attitude pediatricians can help both the parents and the children to create a liveable lifestyle and make their children's schoolwork more successful. The authors' opinion is to near the medical and the pedagogical view, because without the cooperation of these two scientific fields, the affected parents, children and teachers cannot get proper help to find better solution and support for their problems. In the survey the authors intend to give a complex view about the symptoms of these syndromes and try to give useful advice for pediatricians how they can support their patients by emphasizing the key role of pediatricians and clinical expertises in the early recognition and development.

**Key-words:** Dyslexia, Dysgraphia, Dyscalculia, Pediatrician, Diagnosis, Development, Cooperation.

abstract

© Pensa MultiMedia Editore srl  
ISSN 2282-5061 (in press)  
ISSN 2282-6041 (on line)

The exploitation of the topic is hardly complete in Hungary; moreover, there is an increasing demand for interaction and collaboration among the experts dealing with children with dyslexia. This paper – which covers the questions and secondary literature that could come to the assistance of the Hungarian experts as well as the concerned ones – was written for the sake of the more efficient and professional guidance and development in 2013.

Dyslexia, dysgraphia and dyscalculia are specific defects in development; they have an effect on school performance, and mean difficulties or disorders in reading, writing and in the arithmetical skills. Despite the fact that in the ICD system under the main group of mental and psychical behavioural disorders (ICD-10-05) psychical development problems are classified, those problems do not exclusively fall in the domain of psychology and special education. The effectiveness of development is based on the early recognition of the disorder regarding the three skills mentioned above, however, prevention is more important. Both in prevention and in diagnosing, the role of the pediatrician and the general practitioner is to be mentioned.

As a result of frequent consultations with children, parents and the carer establish a certain trust between patient and practitioner; which enables the doctor to notice significant risk factors (medical family history distinctive features of the child in his development). The problems detected in relation to the auditive and motoric area (results significantly departing from the standards) do not in every case originate from damages in the hearing and locomotor but from neurological disorders, which need to be a subject for further examination. On the basis of the examination one can answer the question whether the disorders in the three skills are origination from sensory or primer psychic or neurological disease. The accuracy of the diagnosis has an effect on the effectiveness of the pedagogical work. The attention of the doctor and the professional examination can reveal the roots of the problem and can provide additional information for the special education teachers in choosing the suitable development. Sometimes the parents, the carer or the patient do not know who to turn to – therefore, they ask for the advice of the pediatrician or the general practitioner and only reveal the symptoms connected to their observation and perhaps take them as a manifestation of certain disease – for example of disease connected to memory or the sight. The reason for writing the present article is based on a similar case. The aim of the article is that patients suffering from dyslexia, dysgraphia and dyscalculia are to be diagnosed and treated properly by the pediatricians and by the general practitioners. The other aim of the article is to properly inform the practitioners regarding the topic by providing help with the establishment of a supportive professional network.

## 1. Differentiated diagnostics

The aim of this part is to represent the symptoms of dyslexia, dysgraphia and dyscalculia on the basis of medical literature including the results of various researches. In order to understand the problem more deeply, it specifies the roots of neuropsychological and genetical causes to provide guidelines for pediatricians

and general practitioners for the sake of further professional development.

Children with learning disorders are to be classified in three different groups in Hungary which grouping is based on the gravity of the problem and the development to be applied (Fig. 1.: Groups of Learning Disorders).

Weakness in learning:	Learning of cultural techniques causing temporary difficulties, problems occurring in the personal or interpersonal behaviour, the child is lagging behind the others or falls back in studying due to the numerous absences thereof.
Learning disorder:	Lower performance in learning or in certain parts of learning (mainly in reading, writing, in grammatical writing and counting) which can be traced back to a permanent and serious disorder in certain skill.
Learning disability:	It permanently affects every field of learning, and makes it difficult or even impossible to develop within the framework of primary education. In every case it is accompanied by the developmental disorder of the learning skill.

**Fig. 1. Grouping of learning skills from a pedagogical point of view, based on the subdivision of Judit Táncczos (Tanczos, 2006)**

Undeniably the problem can be of an organic nature as well (for example developmental dyslexia). Dyslexia, dysgraphia and dyscalculia belong to the learning disorders specified in the second group of Table no.1. Learning disorder is a phenomenon hard to be defined – which can be also reflected in the literature and manifested in the changing and synonymous terminology –: special learning disorder, special learning difficulty, partial disorder in performance, partial disorder in certain skills as learning disorder. Due to the complexity of the disorder, dyslexia, dysgraphia and dyscalculia are hard to be defined. As a general rule one can state that children suffering from DIS have problems with languages (mother tongue, foreign language), reading, and writing or with calculation. Problems in speaking and hearing of the phoneme in nursery school are likely to project that the child will need additional help at school. The weakness in recognising the forms of the letters and the weaker skills in differentiating, the underperformance in handy-craft comparing to others from the same age group and the lack of development in hand dominance anticipate that the child will have problems with letters and figures at school. Diagnosing the problem in an early stage is tempting in the sense of prevention, however, it is not recommended to label the child as someone suffering from DIS, since labelling, branding and stigmatizing in this early stage are not beneficial for the child’s development. After the early stage of scheduled learning to read and write – more precisely the earliest in the third grade at school – the child can get a disease code as a DIS patient. The child’s nerve system, skills and abilities thereof rapidly develop in an environment enriched with stimulus, but the individual pace of development can be uneven as well. Huge changing can be detected within several weeks or within a month regarding the small and big movements the development of cognitive, psychic and social skills as well. In this early stage of life for protecting the interest of the child, the usage of the term of dyslexia, dysgraphia and dyscalculia-endangered is not recommended (Gyarmathy, <<http://www.diszlexia.hu/Tzcikk2.htm>>). By the time the diagnosis is recommended, the fact of dyslexia, dysgraphia and dyscalculia in Hungary should be registered in accordance with the internationally accepted disease

codes (Fig. 2.: Performance specific development disorders according to the ICD code system).

The presence of several combined factors is necessary for the emergence of DIS related problems and for the appearance of symptoms thereof (Gósy, 1996). If only one factor appears amongst the combined several factors the symptoms shall not appear due to the plasticity of the brain; therefore, one cannot talk about dyslexia, dysgraphia and dyscalculia.

According to the terminology of ICD, dyslexia is a certain reading disorder classified under F81.00 in the ICD system. How does a person suffer from dyslexia, what problems does he face? The struggle of a dyslexic is threefold in the domain of reading: accuracy, rhythm and understanding of the text. The criteria for accurate reading are the proper phoneme connection. The dyslexic people are therefore often mixing,- changing-omitting and adding letters to the word and making mistakes in the reading order. The majority of dyslexic people, who read in a slowly pace, read out an isolated letter and a part of a word in a similar length of time besides seriality (processing the data in a specific order) has weak syntactical analysis.

Disorders in the psychological development (F80-F89) Main group	
Development disorders attaching to school performance (F81)	
F81.0.	Specified reading disorder (dyslexia)
F81.1	Writing disorder (dysgraphia)
F81.2.	Disorder in the arithmetical skills (dyscalculia)
F81.3.	Mixed disorder of school related skills
F81.8.	Other disorder in development attaching to school related skills
F81.9.	Other not specified disorder in development attaching to school related skills

**Fig. 2. Performance specific development disorders according to the ICD code system**

The definition of the concept is made difficult by the inconsistency of the international secondary literature. In Great Britain, dyslexia is called *specific learning disability*, while in the USA, the term of *learning disability* was spread; however, one can also come across the expressions of *reading problem*, *poor reading*, or *the failure of the mastery of reading* (Gyarmathy, 2012).

The disorder in understanding a text can be caused by the faults in reading techniques (accuracy), vocabulary, the speed of imprinting new information in the memory, the speed of remembering it and the intelligence of the patient as well. A dyslexic person might suffer from dominance disorder (two-handedness), therefore, the lateralization thereof might be delayed or not manifested at all. As the most prominent Hungarian researchers, Ildiko Mexner (Meixner, 2002) and Valeria Csepe (Csepe, 2002) think that dyslexia is an all embracing term, an umbrella term. Various causal and interconnected phenomena lead to reading disorder. Amongst the symptoms one can detect certain brain activity which differs from the non-dyslexic brain activity according to the application of PET examination. During reading not only do those brain parts become active which are responsible for reading, but also the more extended brain territories are em-



played. Due to this increased activity, the completion of a task by a dyslexic adult or child is more energy consuming comparing to a non-dyslexic person (Bauer, 1999). The reason for this phenomenon is that dyslexia has an effect on the work memory as well. Work memory plays a significant role in school performance and in processing and dispatching short term stored data coming from the two sub-systems (visual and verbal memory) (Gathercole, Alloway, 2011). In the framework of a traditional education system obtaining and processing information for a dyslexic person is hopeless as a result of the weak work-capacity (Moody, 2006). Due to this weak work-capacity one can have a false impression that the child or adult is lazy, negligent, inattentive and lacks motivation. The false medical, pedagogical and parental belief might be harmful for the positive self-respect and the psychic well-being of the dyslexic person, which can have an effect on his entire life (Morgan, Klein, 2000).

Dysgraphia is a writing disorder classified under the ICD code of F81.10. A dysgraphic person has difficulties in the lining and the motoric realisation of the letters (the same grapheme is written differently in the same text), moreover, with the subtle movements required to writing and to the coordination of the eye and hand movements. A dyslexic person also runs into difficulties with the phonologic and graphemic coding (similar to the reading accuracy), with the correct usage of punctuation and grammar, furthermore one should face problems in forming of a coherent text with the application of grammatical and text forming techniques. The disorder in dominance can also occur. Disorders in the phonetics and in articulation and obstacles in speaking can influence the process of learning reading, writing and counting. When the practitioner notices a speaking disorder or becomes aware of the fact that a member of the nuclear family of the child suffers from one of the three disorders, it is recommended to initiate the examination of dyslexia, dysgraphia or dyscalculia. Dysgraphia is hardly manifested separately and often comes with dyslexia or dysortography (Scott, 2004). Dysortography is an orthographical trouble, which is similar to dyslexia and the most common one among the trace-symptoms of dyslexia occurring in the adulthood. It can be attributed to spatial-visual and auditive-phonological troubles. In the Hungarian secondary literature, it is also referred to as one of the forms of dysgraphia or as a content dysgraphia (Gyarmathy, 2012).

Dyscalculia is a disorder in the arithmetic skills and registered under the ICD code of 81.20. A dyscalculic person shows the disorder of seriality, time and space orientation and rhythmical skills, mixes the arithmetical operation, uses a wrong order in solving an arithmetical task and mixes the operational parts in it. The dominancy disorder can also be an issue in that case.

The professionals – general practitioners, teachers – are recommended to inform the parents, carers about the necessary examinations and therapies if there is a suspicion of skill disorder. It is suggested that the parents and carers should be informed to turn to special methodical centres or trusts specialised in treating of DIS affected children. Therefore, there is a need for the professional networks and the knowledge of the practitioner in order to provide the parents with the necessary information and to be more convincing in the sense that development is much more useful than turning a blind eye to the problems. For the harmonic development of the child it is crucial to be aware of the reasons for his “difference” and to know what causes his failures at school. There is a contradiction

between the performance and the intellectual ability of the child which in many cases results in frustration, lack of self-assurance, self-esteem and depression. At the early school age these results might be accompanied by constant verbal and physical abuse, negative remarks made by the teacher and the classmates and also alienation from the classmates. The behavioural disorders (clowning, aggressiveness, being introverted) accompanied by dyslexia, dysgraphia and dyscalculia are to be manifested as a compensation and the other concomitant somatic symptoms (emesis, psellismus) are caused by anxiety. In order to ease frustration or anxiety the children voluntarily choose the role of a clown or become aggressive gaining the antipathy of the teachers, the management and the classmates. After several disciplinary decisions and the passing of the obligatory school age these children will drop out of the educational system without having gained any qualification at all (Scott, 2004). However, it is to be mentioned that one is not able to cure or leave behind dyslexia, dysgraphia or dyscalculia. Due to the development, the symptoms of dyslexia, dysgraphia and dyscalculia will be lessened and in the case of an early treatment at the age of 12 only the remnants of the symptoms (different way of thinking and special learning methods) might cause problems in the everyday life (Gyarmathy, 2007).

In our view it is not recommended to treat dyslexia, dysgraphia and dyscalculia as a handicap (unlike the Hungarian Governmental Regulation no.79/2006. IV.5) and it is a better solution to use the notion of skill disorder applied by the ICD system, since in reality it is a special educational need manifested in an educational environment. The pedagogy and andrology in higher education have just started to experiment with the use of the term of analogous with the term of special education. It needs to be accepted by the state educational system. The acceptance of the term of special learning need is mixed and – based on the study of Morgan and Klein – it is a subject for further consideration (Morgan, Klein, 2000). In the case of dyslexic persons, due to the dominance of the right cerebral hemisphere the global learning style is to be regarded typical and they are more effective if they can obtain information from more sources and can learn in an empirical way (Csepe, 2003).

Reading, writing and counting are complex phenomena. The integration of the operation of the organs in speech and the consciousness of the body scheme is required for the proper use of these three skills. According to the neuropsychological researches, a harmonised cooperation of 18 cerebral parts is necessary to learn to read (Gyarmathy, 2012). If this integrated operation is disturbed the learning process (obtaining, processing and reproducing information) faces obstacles. That is why dyslexia, dysgraphia and dyscalculia are regarded as a problem related to school performance which is not caused by the negligence of the DIS person, and which might have psychological or organic explanation.

The cerebral experimenting facilitates the progress in revealing the cognitive and neurological causes of the DIS symptoms. Researches aiming to reveal the cerebral operation, show that in dyslexia, the visual magnocellular system is affected including its auditive and motor centre. Foreign neurological and neuropsychological examinations have shown the lack of symmetry between the two cerebral hemisphere such as the smaller gyri in the planum temporale and the larger number of ectopies and microgyri in the same cerebral area comparing to the average (Galaburda, Livingstone, 1993). This cerebral discrepancy might



be responsible for sight problems, reduced consciousness in phonology and for the motor awkwardness. On the basis of the research of Galaburda, the left cerebral hemisphere of a dyslexic person is not functioning properly, which causes difficulties in the linguistic process and in the lower graded linguistic and assertive processes. The majority of the dyslexic people have right cerebral hemisphere dominancy, therefore, the space and visual skills are better than the verbal ones, which means that dyslexic persons perform better in tasks requiring the use of the right cerebral hemisphere. The research of Galaburda points out two crucial cerebral characteristics: deformity and difference in the cortex and a minimal morphological difference between the two cerebral hemispheres. The characteristics of an asymmetric brain are that the planum temporale on the left cerebral hemisphere is bigger comparing to the one on the right cerebral hemisphere. In the case of a dyslexic person, the planum temporale in both sides is more developed – as a consequence, there is a difference between the connection and the information transmission of the two cerebral hemispheres.

The dysfunctional cerebral development resulted in dyslexia, dysgraphia and dyscalculia can be caused by the mutation of the 6<sup>th</sup>, 13<sup>th</sup> and 15<sup>th</sup> chromosome (Csepe, 2005; Csepe, 2009; Porkolabne 2005). Researches have pointed out that the tendency or the entire bundle of symptoms might be hereditary. This finding is confirmed by the frequency of the disorder in the family and by the larger number of persons born with XXY chromosome (<<http://www.news-medical.net/health/Chromosomal-Abnormalities.aspx>>). Intrauterin or perinatalis teratogen influences might play a role in the development of the mentioned skill disorders (Colewa, Heber, Hollweg, 2008). To take the psychological and pedagogical approaches into account, we can assume that the cause triggering the disorder can be a psychosocial damage (a negligent environment which lacks in stimulus, where the physical, emotional and intellectual development of the child is endangered) experienced in the early childhood which burdens the nerve system.

## 2. Possibilities for examination

The previous part of the article pointed out the crucial role of the practitioner – following the physical development of the child – in the early recognition of the skill disorder. The medical reports of the practitioners provide help for the specialists by carrying out examinations regarding dyslexia, dysgraphia and dyscalculia in order to make a detailed anamnesis which encompasses pregnancy and the circumstances of the birth, the major junctions in the child's development and the obstacles in it, the serious sicknesses and the hereditary medical problems in the family. In those cases when the parents, the carer or the affected adult ask the opinion of the practitioner for further examination, the time invested in making a detailed anamnesis contributes to create a trust- based relationship between the practitioner and the patient (or the representative thereof). What can the practitioner do when he/she notices the symptoms of dyslexia, dysgraphia or dyscalculia or where the practitioner is aware of the factors of the disorder? The practitioner can direct the patient to a special institution when examination shall be carried out – based on a standardised procedure – regarding the skills and abilities that define the school performance of the pa-

tient. Due to boundaries of the article we shall not detail the examinational methods. The aim of the article is to collect information based on which the practitioners may more effectively obtain more knowledge and be able to inform the parents and the adult patients about the disorder.

In Hungary the examination of dyslexia, dysgraphia and dyscalculia initiated by the parent, carer or an educator is to be carried out – based on the information previously collected – by professional committees or units specialized in rehabilitation consisting of pediatricians, special educators, psychologists and psychiatrics. The role of the committees or units specialized in rehabilitation is to examine the learning abilities of the child. The parents are entitled to ask for an expert's opinion regarding the early development, obligatory education, nursery education and preschool preparation of the child and they are also entitled to hear an expert's opinion regarding the fulfilment of the obligatory educational years. The family protection unit and the Office of Child Protection and Guardianship in Hungary are entitled to recommend the parent to be presented at an examination with the child. According to the Hungarian practice, until 31 March in every calendar year the pedagogical and psychological counsel is entitled to recommend the parent, the carer to be presented in front of a specialist for the purpose of an examination of a physical, sensory, intellectual, speaking related or other disorder – safe for the fact when a professional opinion is required after the date given. The parents or carer have to agree with the examinations carried out by the professional committee and have to initiate them. The behaviour, the development, the progress of the given child at the school and nursery school have to be described in the application and also have to provide grounds for the examination. At that point the cooperation between the parents or carer and the educator, pediatrician or the school doctor is crucial. The often phased examination of the committees takes a couple of hours and if it is possible diagnostic is provided – safe for the fact when further special examinations are necessary, which can not be carried out in front of the committees. The child is always accompanied by the parents or the carer who have to take the medical reports of the child, the school papers (as a general rule the maths and writing papers) and the medical appliances or equipments thereof. The parents are obliged to present a form according to the Hungarian MKM Regulation no. 14/19994 (VI.24.). The form is filled out by the general practitioner when the child reaches the age of five based on the information given by the midwife, therefore the form can be used in a further examination in order to make an anamnesis. The form contains the learning disorders previously occurred in the family and also contains information regarding the psycho- motor development typical at the age of the examined child. The child and the person who accompanies him to the location of the examination are entitled to get the reimbursement of the travelling expenses based on the form issued by the general practitioner. On the basis of the practitioner's form the committee will issue an invoice covering the travel expenses of the child back home. The examination is otherwise free of charge.

After the obligatory school age is passed or in the case of students accepted in higher education, the Department specialized in Rehabilitation of the Budapest Metropolitan Office carries out examinations regarding dyslexia, dysgraphia and dyscalculia based on the Governmental Regulation no. 92/2008 (IV.23.). The for-





eign applicants aiming to enter the Hungarian higher education system have to obtain the opinion of the expert according to the Hungarian legal requirements. The internationally accepted ICD facilitates the diagnosis of the disorder in Hungary. The examination is initiated by the young adult subject to examination and has to contain the reasons of the examination. In order to benefit from the advantages described in the Governmental Regulation no. 79/2006 (IV.5.) it is recommended to refer to the problems occurred during the fulfilment of the obligations in the higher educational institution and also recommended to refer to the previous examinational results if the applicant possesses the opinion of a specialist. The applicant has to attach the previous medical reports, medical opinions and the opinions of certain professional committees to the form. The examination takes a couple of hours in front of a panel of four (4) which deliver a professional opinion at the end of the examination. The examination is free of charge and having the final decision requires approximately 2 months. The general practitioner of the applicant is not entitled to certify an entitlement for additional points in the application process for gaining a place in higher education; therefore, the higher educational institution is not entitled to accept any kind of medical opinion either. It is recommended for the general practitioners to pay attention to this and they have to inform the patients accordingly. The general practitioners help more by directing the patient to other examination centres rather than issuing medical opinions which are useless for the patient. The benefits and other advantages provided by law in the application process and in higher education can only be obtained from certain examination centres mentioned above and based on the opinion of a specialist or committee, which opinion contains the ICD code of the disorder. The general practitioners, therefore, are obliged to direct the patient to the organisations indicated in the law, which are entitled to issue medical certification regarding the disorder. The general practitioners can provide help to the patient suffering from dyslexia, dysgraphia and dyscalculia by directing him to a coordinator working in the higher education system specialized in handicap issues or disorders, who can provide further help in the course of his studies. The application process in higher education is under reforms. According to the plans of the Government from the year 2013 extra place will be designated for the applicant with disabilities – which in the present case is applicable for applicants suffering from DIS. Seemingly, the possibility will no longer be applicable which enables the applicants with disability to gain the maximum possible 40 points in applying for a university place, which point has to be gained by the applicants with no disabilities according to the general point calculation. This changing will not affect the rules of verifying the disorder; therefore, the previous tasks of the general practitioner's will be unchanged. The notifications of the webpage of <[www.felvi.hu](http://www.felvi.hu)> are to be regarded official and updated; therefore one can refer to them freely. Thus it is recommended to search for information from that web page concerning the verification of the disorder and the legal background.

### 3. Therapeutic and development possibilities

On the basis of the statements written in the diagnostic part of the article, it might seem that the learning difficulties can be cured or alleviated by certain medical treatments, like the psychic disorders occurring in childhood. One cannot make a judgement on the possibility to treat the disorder which provides an escape route for the pedagogues from solving the more and more obvious social-cultural problems manifested in the learning process (reading, writing and counting) during the use of linguistic skills. The fact is that DIS is a complex phenomenon and the school is not able to terminate all the effects triggering or sustaining (for example the social-cultural status of the family) the disorder. This task does not fall inside the jurisdiction of the school but it is not in the jurisdiction of the general practitioner either!

The sectoral cooperation, the professional dialogue between the DIS affected person and his environment is a more effective solution. The conservative medical treatment is not a perfect solution in itself, however it can be successful combined with other therapies (for example dyslexia reduction, integrative senso-motoric development). In order to avoid further failure at school and to enhance success it is recommended to choose a method which encompasses the development of reading, writing and counting skills in an empirical way and with which the child will regain his faith in his capability. In Hungary the results and methods of Brigitte Sindelar, Sally Goddard, Ildikó Meixner and Anna Dévényi are to be regarded as the most recognised ones. The medical treatment creates the impression of a sickness and also the illusion that the recovery is possible after a certain period of time. In the case of patients showing mental or behavioural disorders – which can be the accompanying symptoms of dyslexia, dysgraphia and dyscalculia – one has to take the risk factors of drug addiction into account as well as the toxic effects manifesting in a long term. The parents and patients diagnosed with DIS in adulthood with a failure-packed history are tend to accept – and are keen on asking for – a medical treatment, because medicine provides an escape route from the responsibility of education and self-management. The persons suffering from dyslexia, dysgraphia and dyscalculia have to face the fact that they shall have difficulties in their everyday life in situations where reading, writing and counting skills have to be applied. However, with the methods learned during the therapies the difficulties can be alleviated or counterbalanced. In the Hungarian practice the medical treatment of the practice is financially not supported by the state. The metabolism of the nerve cells can be enhanced; the medicines containing the agent piracetam – the agent is to improve the operation and the structure of the membrane – can only be prescribed by the practitioner. However, one cannot obtain state benefits or any other financial benefits regarding these medicines. Sadly state benefits for therapies can only be obtained within the compulsory schooling age.

The development regarding dyslexia, dysgraphia and dyscalculia diagnosed in adulthood – typically during the higher educational studies – can only be carried out on a self-financed basis. According to section 18 (2) of the Governmental Regulation no. 79/2006 (IV.5.), in Hungary the person suffering from speaking or any other forms of handicap is entitled to have benefits regarding the studying and exam requirements (longer preparation period, the opportunity to choose



the form of the exam, partial or complete immunity from obtaining a certificate in a foreign language, using of special tools as a compensation of the disability). The child within the compulsory schooling age is entitled to benefit from pedagogical services (for example speech development) free of charge based on section 18 (2) of the Act of 2011. CX. on State Education of the children falling within the compulsory schooling age. The benefit can only be obtained based on the results of the examinations carried out by professionals or the committees specialized in rehabilitation. Beyond this, the parents have an opportunity to choose from the vast amount of therapies provided by non-profit or profit orientated organisations. In Hungary, the parents can find additional information on the websites of the pedagogical service providers, which draws the attention of the parents and the educators to other opportunities, as well. There are web pages specialized in dyslexia, dysgraphia and dyscalculia containing the researches, the results and the suggestions of the most prominent researchers on the topic; they also contain the description of the methods which can be used both at home and in the school environment, as well. The web pages can contain sample lessons or exercises, guidance and they can also provide a possibility to order previously published materials on the subject.

Despite the fact that the aim of the article was to underline the role of the pediatricians and the general practitioners in recognising the permanent learning disorder and also emphasizing their special part in the treatment it is not to be forgotten that dyslexia, dysgraphia and dyscalculia do not exclusively fall in the jurisdiction of medicine and should not be treated as diseases but as permanent specific learning difficulties which effect the operation of the nerve system. It is a learning disorder which the affected person cannot overcome and is in need of the support of the specialists. Reading, writing and counting are generic skills which are indispensable in obtaining education and also in the situations of everyday life. Dyslexia, dysgraphia and dyscalculia inflict the choice of a career, entering into higher education and also the chance to find a place in the labour. The early realisation of the disorder and development (which can be medical, educational, therapeutic and a combination of the different ways of professional development) can alleviate the problem. The tools and methods of rehabilitation and development pedagogy, which are based on the results of psychological and neurological researches, provide several solutions for those who struggle with the disorder. Every participant in the environment of the person affected with the disorder is responsible for providing a receptive environment and to enable him to succeed in life.

#### **4. Frequently asked questions, inasmuch as what can the practitioner reply to the questions?**

In this chapter those questions shall be presented which are frequently asked by the parents and the adults suffering from DIS from the general practitioner in Hungary. The parts written in a cursive form represent the questions and the suggestions of the practitioners.

### **Is dyslexia, dysgraphia and dyscalculia a hereditary disorder?**

The answer is yes, dyslexia, dysgraphia and dyscalculia can be hereditary. Hereditary means that DIS related problems are more likely to be presented within the family.

*Do you remember that someone in the family had difficulties with reading, writing or counting even in adulthood?*

### **What causes the symptoms?**

The causes of the symptoms can be a mutation in the chromosome, a damage occurred in the uterus or during child birth, damage occurred in the early age which might cause abnormal cerebral operation, the harmful environment and many more factors. On the basis of the present scientific results one can not provide an accurate answer for this question without carrying out a detailed examination. Dyslexia, dysgraphia and dyscalculia are complex disorders with various factors which are individually variable. The same cause can be resulted in a different consequence placed in a different environment. The hereditary factor also affects the development of the environment and the fenotype, therefore, making a detailed anamnesis is crucial.

*Has an infection, poisoning, psychic trauma occurred during pregnancy? Were there any complications during child birth? Did the child have an injury during his early age?*

### **Is it recommended to examine the brothers or sisters of the child suffering from dyslexia, dysgraphia or dyscalculia or in the case of a DIS affected parent the children thereof?**

If similar symptoms are detected the examination is necessary in order to start the professional development as early as possible. On the basis of the frequency of the symptoms within the family, and if the psychological and neurological problems – problems affecting the knowledge function and the development of the behaviour – are manifested in the parents, the examination of the child is highly recommended.

### **Can a DIS affected child be cured from the disorder?**

The answer is definitely no. One can not erase dyslexia, dysgraphia or dyscalculia, but there is a ray of hope. The symptoms of the disorder can be alleviated by different and individually tailored development which is beneficial for the natural development of the child. After the age of 12 only the remnant symptoms shall cause problems in the everyday life. These problems can be manifested in the characteristics of the individual studying and life coaching methods originating from the different way of thinking of the DIS affected person.

*The parents are recommended to contact other parents with DIS affected children through trusts or other special organisations. For the parents it is hard to face the fact that the problem can not be solved by medication and the problem accompanies the whole life of the child. In this situation it is really comforting to*



receive advice from those parents who have successfully struggled with the problem and who are still effectively coping with it.

### **What kind of therapeutic options are available?**

Fortunately the supporting network in Hungary is operating in a wider spectrum and accessible for more and more dyslexic, dysgraphic and dyscalculic children and adults, as well. Besides the cognitive development it is the motoric development which is indispensable. The motor development can be physical education and other forms of workouts which stimulate and help the development and integration of the nerve system. The Ayres development (integrative sensorimotoric development) is an effective development for children suffering from DIS so are the basic development (complex development for the development of the nerve system which is based on movement development) and the method of Anna Dévényi (complex development which encompasses the direct nerve stimulation and the development of the harmonic body image). It is inefficient to stimulate the problematic skills in an aggressive drill-like way; however, practice makes wonders. On the dyslexia specialized web pages, series of practices, ideas for playful exercises and guidelines are available for the parents, which can be downloaded as well.

*In order to provide immediate information—since it is possible that the patient will not go for a consultation for a long time – it is recommended for the practitioner to create a chart for himself containing the contact information regarding the various therapeutic methods.*

### **Should the child endangered with dyslexia, dysgraphia or dyscalculia stay in nursery school before primary school for an additional year?**

Dyslexia cannot be grown out therefore the child shall not obtain any benefit from staying at the nursery for an additional one year. If the child is mature for primary school it is not justifiable to keep him at the nursery for another year. The not so encouraging failures at school can be counterbalanced by a well-founded school and pedagogue choosing as well as with therapies and a caring and supportive parental attitude.

### **What kind of school shall I choose for my child?**

DIS affected children should not be enrolled automatically in school with a special educational profile and with special educational syllabus. It is recommended to choose an institution where the individual characteristics, the special learning and studying needs of the child is taken into consideration; where the teaching is based on a proved educational program which ensures the development of the DIS affected child. It is recommended to find a school using dyslexia-preventive and reducing method (for example in Hungary, Lexi can be a good choice – a program, the dyslexia-preventive and reducing method of Ildikó Meixner, the Wonder of tales program). Apart from choosing the best method, the personality, the experience and the dedication of the educator is also of a great importance. A receptive and loving pedagogical attitude also constitutes determinative importance during the cooperation between the child and the

pedagogue. Pedagogical and psychological counsels can suggest schools and the committees specialised in rehabilitation and the examination of the children's skill designating the closest and the most competent institution for the DIS affected child. There are state financed and non-profit institutions, as well, and the financial capacity of the parent is also a determinative factor in choosing a school. One badly selected school might shatter the child's self-confidence self-esteem and motivation for studying.

*It is recommended to collect the brochures of special educational institutions and make them accessible in the surgery for the patients in order to distribute the information between each other. The suggestion of the neighbour can help in choosing a school; however, in this respect the practitioner has an important role.*

*It is also recommended for the parents to visit open days in these special institutions, get to know the pedagogues, the pedagogues specialized in development and the school psychologist; to visit the lessons of the future pedagogue of the child assuming that the parents will bring a DIS affected child in the class. The first reactions provide a good starting point.*

#### **Is it important to tell the diagnosis to the pedagogues?**

The answer is definitely yes. The younger the child is the more important it is to obtain a treatment adjusted to his special needs. In this case, the schools can provide an individually tailored developmental program and both in state education and in higher education the individual needs of the DIS affected person is taken into account. One can get help from the pedagogue, the teacher, the coordinator in handicap issues. If the diagnosis is not revealed, the child and the young adult are not helped in overcoming their disadvantage. In order to use the benefits and the special advantages suggested in the expert's opinion the parent or the young adult should let the institution know about the problem since these cases should be registered and the institutions have to make a decision to let the child or young adult depart from the general requirements. There are pedagogical consequences of the studying disorder, therefore, one cannot interpret and treat it only from a medical point of view.

#### **Should a dyslexic or dysgraphic child get and exemption from learning a foreign language or a dyscalculic child from studying mathematics?**

Getting an exemption from studying – the answer is absolutely no. The dyslexic and dysgraphyc child is also capable of learning a foreign language if the methods are adjusted to his special needs; studying mathematics is also not an impossible venture for a dyscalculic child with a suitable learning programme. An individually tailored teaching method and evaluation, which focuses on the positive and the small achievements, are necessary. One should get information from the institution and from the teacher regarding the special teaching methods, the alternative and special possibilities in the fulfilment of the requirements. There are foreign language courses – mainly English courses – designed for dyslexic students. Naturally, on the basis of the expert's opinion one can get partial or total exemption from studying a foreign language; however, in a later stage – in higher education or in entering service – the knowledge and the skill will be



missed, which shall reduce the possibilities of the DIS affected person in the labour market and in the personal sphere as well.

### **Is a DIS affected child capable of attending higher education?**

Due to an early examination and to an effective development the secondary school and the higher education system are open to the DIS affected children, as well. One should not make a hasty decision in choosing a profession and it is recommended to consider which personal, interpersonal or method competencies are required to be successful in the given profession. The professional requirements can be downloaded from the webpage of a governmental institution responsible for granting a diploma in a specific profession. In the case of a higher educational institution it is suggested choosing an institution which fits in the interest sphere, the studying style of the young adult. One has to make sure about the quality of the activities providing equal opportunities and also the requirements of the institution. The advantages and disadvantages of the child can be defined by a profile test which can be helpful in making a decision. Cognitive profile test can be downloaded from the websites of the most prominent Hungarian researchers in dyslexia, dysgraphia and dyscalculia (<[www.diszlexia.hu](http://www.diszlexia.hu)>).

### **What can be done to avoid psychological damages?**

It is recommended to carefully choose a school. The attitude of the school, the attitude and the competence of the teachers are crucial. It is advised to visit the school in advance when orientation days are organised in order to let the child meet his future teacher or pedagogue and to find out whether they can mutually accept each other. One should tell the child the diagnosis and has to explain it in a way which is in compliance with his age. If the child shows the symptoms of a behavioural disorder it is recommended to direct him to the school psychologist or to a child psychologist who can reveal the origins of the problem and who can provide solution to it.

## **References**

- Bauer J. J. (1999). *Too much time on Sycamore Street*. Mineapolis: Educational Media Corporation.
- Cholewa J., et al. (2008). The cognitive neuropsychology of disorders of the reading-learning [Die kognitive Neuropsychologie der Störungen des Schriftspracherwerbs] In *Heilpädagogische Forschung*, 4.
- Chromosomal abnormalities*. In: News Medical <<http://www.news-medical.net/health/Chromosomal-Abnormalities.aspx>> Accessed: 22.10.2012.
- Csépe V. (2002). From word blindness to dyslexia. In T.T. Martonne (Ed.), *Development education. The development of major theoretical and practical procedures*. [A szovaksagtól a diszlexiaig. In T.M. Martonne (ed.), *Fejlesztő pedagógia. A fejlesztés főbb elméleti és gyakorlati eljárásai*] ELTE Eotvos Kiado: Budapest [Hungarian].
- Csépe V. (2003). Self, the promising negativity. Event-related brain potentials in speech perception and assessment of dyslexia [EN, a sokat ígérő negativitás. Eseményhez kötött agyi potenciálok a beszédészlelés és a diszlexia vizsgálatában.] *Magyar Pszichológiai Szemle (Vol. 2, pp. 243-267)* [Hungarian].
- Csépe V (2005). *Cognitive developmental neuropsychology*. [Kognitív fejlődés-neuropszichológia.] Gondolat Kiado: Budapest, 235-245 [Hungarian].

- Csépe V. (2009). Do we read well the message of the genes from the genes of poor readers? [Jól olvassuk-e a genek üzenetét a rosszul olvasók genjeiből?] *Pszichologia* (Vol. 29, pp. 63-76) [Hungarian]
- Galaburda A., Livingstone M. (1993). Evidence for a magnocellular defect in developmental dyslexia. *Ann. N Y Acad. Sci.*, 682, 70-82.
- Gathercole S. E., Alloway T. P. (2011). *Working memory & learning. A practical guide for teachers.* SAGE: London.
- Gósy M. (1996). Hemispheric dominance, speech perception, difficulty in reading. In M. Gósy (Ed.), *Difficulty of speech perception and understanding in the childhood.* [Agyfelteke-dominancia, beszédészlelés, olvasási nehézség. In M.K. Gósy (Ed.), Gyermekkori beszédészlelési és beszédmegértési zavarok.] Nikol Gmk.: Budapest, 163-176 [Hungarian].
- Gyarmathy É. (2012). *Identification and development of learning disabilities in the kindergarten and in the primary school.* [Tanulási zavarok azonosítása és kezelése az óvodában és iskolában.] In: <http://www.diszlexia.hu/Tzikk2.htm> Accessed: 22.10.2012 [Hungarian].
- Gyarmathy, É (2007): *Dyslexia.* Budapest: Lelekben otthon Kiadó.
- Gyarmathy É. (2012): *Dyslexia in the digital age* [Diszlexia a digitális korszakban] Budapest: Műszaki Kiadó [Hungarian].
- Meixner I. (2002). *Method of the dyslexia prevention and reeducation* [A diszlexia megelőzése és reedukáció módszere.] Budapest: Barczy Gusztáv Gyogyepedagogiai Tanárképző Főiskola [Hungarian].
- Moody S. (2006). *Dyslexia. How to survive and succeed at work.* London: Vermilion.
- Morgan E., Klein C. (2000). *The dyslexic adult in a non-dyslexic world.* London: Whurr Publishers.
- Scott R. (2004): *Dyslexia and counselling.* London: Whurr Publishers.
- Porkolábné B. K. (2001): *Diagnostics and development of the learning difficulties. University lectures to psychology students.* [Tanulási készségek diagnosztikája és fejlesztése. Egyetemi előadások pszichológus hallgatóknak.] Budapest: ELTE BTK [Hungarian].
- Tánczos J. (2006): *There is a problem with learning.* [Baj van a tanulással] Debrecen: Pedellus Tankönyvkiadó [Hungarian].