CONDUCTIVE EDUCATION:
A SPECIAL EDUCATIONAL METHOD
TO PROMOTE DEVELOPMENT

Theses of a PhD Dissertation

Dr. Medveczky Erika

Consultant: Dr. Mészáros Judit, Professor
Program Co-ordinator: Dr. Sótonyi Péter, Professor

Semmelweis University School of PhD Studies
Pathological Sciences
Research in Public Health and Health Program

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Introduction

According to the data of the 2001 census Hungary has 577,000 inhabitants with intellectual, sensory or motor disorders. In compliance with the principle of equal opportunities society has to make various rehabilitation services available for those in need. One of the rehabilitation methods with an educational approach was worked out more than 50 years ago by András Petõ on an empirical basis. The truth of the theoretical principles of his method, which he called conductive education, has not been established to date. Within the field of educational rehabilitation this method represents a special pedagogical tendency of integrating educational theory. It is tertiary type rehabilitation, for, if employed as early intervention, it affects the prevention of pathological development caused by damage to or developmental abnormalities of the central nervous system and the alleviation of permanent consequential symptoms.

Its greatest effect is achieved in cerebral palsy (CP) if intervention starts in the early years of life. Apart from CP it is also employed in spina bifida (SB) for early development and conductive education at kindergarten and school.

Movement and cognition are inseparable, thus especially in the early phase of development it is advantageous if the same person, the conductor is in control of the dysfunctioning child's development and education. Self help skills, toilet training and locomotion are taught as appropriate for the given age while kindergarten and school education are also provided. For almost 50 years, instead of stressing differences conductive education has focused on retardation and the special educational needs and demands arising therefrom.

Conductive education builds on the learning capacity of brain structures; movements and self help skills are learned, toilet training and integrated personality development achieved through cognition (rhythmical intending).

In order to ensure comprehensive, high-standard provision for children with SB aperta/cystica receiving conductive education at the International Petõ Institute, almost 17 years ago a multidisciplinary working team was set up. Parallel with the protection of the uroepithelium the condition of the urinary tract as well as the process and the effect of urination conditioning was studied in a selected group of SB children at kindergarten age.

Objectives

1. In order to learn more about the aetiopathogenesis of neural tube defects (NTD) and the related epidemiological data in Hungary we studied informative offspring with the said developmental abnormality.

Our research treated the possible relation between the origin of NTD and

1.1. periconceptional prevention (multivitamins/folic acid) and socioeconomic status of the parents,

1.2. the maternal use of drugs during the second gestational month and

1.3. acute and chronic maternal diseases during months I-II as well as III-IX of the pregnancy.

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2. Study of children with inborn NTD (SB aperta/cystica) receiving conductive education:

2.1. We wanted to see whether conductive education for SB children was safe if realised in collaboration with a multidisciplinary system of provision and working team.

2.2. For the protection of the uroepithelium we intended to determine criteria precluding the employment of voluntary urination.

2.3. We endeavoured to examine correlations related to the procedure of urination conditioning as applied in conductive education with regard to

a) vesicoureteral reflux (VUR),
b) urine retention,
c) urinary tract infection,
d) intermittent catheterisation and
e) social continence.

2.4. We looked into the question whether the neurogenic bladder, caused by SB is a suitable model to prove the existence of the learning process when adopting the method of urination conditioning as applied in conductive education in a group of carefully selected children.

2.5. We tried to establish new statements on conductive education, based on the results of our clinical examinations. It was our ambition to call attention to the studying of intending, adopting functional neuroradiological and electrophysiological methods.

Group of patients and methodology

There are *no objective methods* to measure achievable development in a learning process in CP since the effect of **spontaneous maturation** must also be considered. Disregarding this we would come to false conclusions. **Thus instead of studying CP cases I have chosen children with SB originated by NTD in order to verify the learning process adopted in conductive education, given that in the latter group the irreversible organic neurological defect precludes the possibility of development induced by the spontaneous maturation process.**

In order to realise our objectives, (epidemiological and clinical) research focused on two areas:

1. Epidemiological research

1. Three factors possibly influencing the development of NTD were examined in 1,202 informative offspring (including deceased foetuses, elective abortions and live births) with NTD. Two control groups were set up: a population control group i.e. cases with no developmental anomalies and a patient control group i.e. cases with other developmental anomalies.

1.1 Data concerning NTD were received from the Hungarian Congenital Abnormalities Registry (HCAR) and the Hungarian Case-Control Surveillance of Congenital Abnormalities.

1.2. Parents had been given questionnaires, thus some part of the examined data were delivered directly by the families.

1.3. Data regarding medicines prescribed during pregnancy and maternal diseases were elaborated on the basis of the records of perinatal care which we had received from the mothers.

1.4. District nurses contributed to our work in those cases where parents had not responded to our letters. They visited and questioned the families who had offspring with devlopmental anomalies and 200 families from the population control group.

2. Clinical research

Following the establishment of the multidisciplinary working team the development of the learning process was studied in 112 children with SB aperta/cystica (age range: 2-7 years) receiving conductive education at the International Petõ Institute.

2.1 Comprehensive urological examination (serial urine bacteriology test, US to assess the urinary tract and urine retention, kidney function, i.v. pyelography, urodynamics test, miction cystography, kidney scintigraphy) was carried out according to the protocol drawn up by the working team in order to assess the condition of the urinary tract.

2.2. In order to protect the urinary tract, in compliance with the criteria set by ourselves we carefully selected the children who seemed suitable to learn the procedure of voluntary urination.

2.3. The possible occurrence and extent of vesicoureteral reflux (VUR) was assessed prior to the onset of conductive education and regularly checked in the subsequent phase.

2.4. The procedure of urination conditioning was defined and regularly controlled.

2.5. a) Prior to the onset of conductive education we wanted to clarify the possible occurrence and frequency of VUR. Its development was followed during the whole conductive education period and also after its termination. The stages of VUR were compared concerning one calendar year prior to and succeeding conductive education.

b) Using US the extent of retention was assessed before the start of the conductive education process and then checked continuously during the whole conductive education period. Finally, the measuring was also accomplished after conductive education had been finished.

Based on the US examination of the bladder, three groups were established according to the amount of retention: *(i)* bladder with *good* voiding function, residual volume maximally 20 ml, *(ii)* bladder with *medium* voiding function, residual volume 20-50 ml, *(iii)* bladder with *minimal* voiding function, residual volume 50 ml or more.

c) Urine bacteriology tests were carried our regularly in order to diagnose and treat possible urinary tract infections.

d) The development of VUR was followed up.

e) The development of social continence was assessed.

Performances prior to the onset of conductive education and reflecting the development of urination conditioning (at the end of the conductive education process) were compared.

Results, conclusions

On the basis of the epidemiological research the following was ascertained:

1.1. Regarding the **socioeconomic (employment) status** of the *mother* we did not find significant differences (t=2.4; p=0.02) among the three groups of NTD, i.e. anencephaly (AN), SB and encephalocele (EC). A comparison of the *socioeconomic status of the father* revealed that the proportion of intellectuals (OR=1.5; CI=1.3-1.8) and managers (OR=1.5; CI=1.3-1.7) was highest while the proportion of semi-skilled and unskilled workers was lowest in offspring with NTD. Thus in Hungary there is no definite correlation between the *origin of NTD* and the *socioeconomic status of the parents*. Looking at the maternal use of *folic acid*, the second lowest value was found in intellectuals in the NTD group while these mothers had the second highest value in the population control group. Although the group of intellectuals showed the highest proportion of the periconceptional use of folic acid (3.6-5.4%) and the use of multivitamins during pregnancy (4.8-6.6%), these proportions were low.
The *periconceptional use of folic acid* and the *use of multivitamins during pregnancy occurred least frequently in the NTD group* as compared to the patient control group and especially the population control group.
1.2. The prevalence of **acute and chronic maternal diseases** shows different tendencies between the NTD and the population control groups and between the NTD and the patient control groups. The prevalence of **acute maternal diseases** was generally higher in the NTD group in gestational months I-II than in the population control group: the OR was significantly higher in influenza (OR=3.1; 95% CI=2.3-4.3) and nasal catarrh (OR=2.8 95% CI=2.1-3.6) and it is worth mentioning that the values of OR in cystitis (OR=2.7) and vaginitis (OR=1.8) were also higher in the NTD group. Regarding the occurrence of **chronic maternal diseases** we did not reveal considerable differences between the study groups in the first and the second gestational months. Exceptions were migraine-type headache, ovarian cysts and other chronic illnesses of the genital organs. Comparing NTD with the population control group OR=1.6 in the case of migraine-type headache.
1.3. Comparing the **maternal use of drugs during pregnancy** among offspring with NTD and population control groups on the basis of data regarding 121 agents, the NTD group generally had a higher prevalence of medicinal treatment but it usually *did not exceed the significance level*. Nevertheless, we found 11 medicines the use of which showed higher values in the

second gestational month in the NTD group than in the population control group. In general the prevalence of medicinal treatment was similar in the NTD and the patient control groups, only 4 medicines were taken more frequently in the NTD group during the second gestational month.

Summarising our study we can ascertain that drugs used during pregnancy do not contribute significantly to the origin of isolated NTD. Nevertheless, there is a causal relationship between the use of certain medicines (oxytetracycline, carbamazepine and valproate acid) and the origin of NTD. Some other medicines, e.g. high dose oestrogen, clomifen, chorial gonadotropin, lynesterol and ergotamin may indirectly influence the origin of NTD.

2. Results of the research into the comprehensive method and process of urination conditioning

The procedure of voluntary urination was studied in 112 spina bifida children receiving conductive kindergarten education.

2.1 According to the study protocol, following the assessment of the urinary tract a neurogenic bladder was found in 92% of the children (n=103). We established exclusion criteria and advised against the practice of voluntary urination with each child who presented any of those criteria. Thus we can ascertain that with the protection of the urinary tract and the exclusion of endangering factors the practice of urination conditioning in SB children is safe.

2.2. In compliance with the protective approach set down under the objectives, considering the criteria precluding the application of voluntary urination (age below 3 years, considerable retention, VUR in phases IV-V, flaccid bladder + VUR, bilateral VUR, recurring pyelonephritis, medium or severe mental retardation) 42 children were not allowed to practise conditioning.

2.3. a) The **origin of NTD** was examined prior to the onset of conductive education (n=112). Surprisingly, below the age of 3 years its occurrence was confirmed in 61.5% of the children. By the age of 7 years the prevalence diminishes (35.7% in 6-7-year olds).

The **occurrence and different stages of** NTD were compared regarding one calendar year before and after the conductive education period. Statistically significant correlations were not found (p=0.10), however, a tendency of diminishing was seen in the number of cases representing stages III-IV during the period while conditioning was employed.

b) With the help of US we compared the amount of **retention** in the bladder prior to the onset of conductive education and at the stage when conditioning had already been

established. Comparing the two periods, a highly significant statistical correlation was confirmed between conditioning and the tendency of retention ($p<0.0001$).

c) With regard to **urinary tract infections** our examinations revealed a highly significant correlation (p=0,0001) comparing the 4 months prior to conditioning and the fourth month from the onset of conditioning.

When we compared the occurrence of *infections during one calendar year* before and after the conductive education period, we did not find a significant correlation between conditioning and urinary tract infections ($p=0.12$). At the same time the number of cases without infections increased from 10% to 27.1%, the number of cases with 1-2 urinary tract infections per year diminished from 32.9% to 12.9% and the tendency of cases with less than 6 infections per year also changed for the better, decreasing from 17.1% to 12.9%.

d) The **urination procedure** was studied during the calendar years preceding and succeeding the conductive education period. Ongoing bacteriology control allowed for omitting intermittent catheterisation where the bladder had good voiding function (retention below 20 ml) if laboratory findings were negative. The majority of the children were able to void urine voluntarily (67%), conditioning became a practice and due to the low amount of retention (below 20 ml) routine intermittent catheterisation was not required. Where the retention was 50 ml or higher, intermittent catheterisation was performed 2-4 times daily, irrespective of the findings of the bacteriological tests (26%). In these cases intermittent catheterisation was combined with conditioning. 7% of the children needed catheterisation to eliminate retention. They represented a minority of the group (n=5). With this knowledge the *routine, automatical application of catheterisation can be avoided*.

e) Analysing **social continence** and urination conditioning as applied in conductive education, a statistically significant correlation was confirmed when comparing the periods preceding and succeeding conductive education ($p=0.02$). In the course of conductive education conditioning is taught parallel with achieving toilet training physiologically. 20% of the children were socially continent (remained dry over two hours or more), 38.6% could hold urine for less than two hours but were not incontinent and the proportion of those permanently incontinent decreased from 61.4% to 41.4%.

2.4. The process of promoting urination conditioning **proved a suitable model** to verify the existence of the learning process with regard to neurogenic bladder caused by SB.

As a result,

– a determining factor of personal hygiene, the demand for voiding the bladder in a circadian rhythm evolved,

– the amount of urine retention decreased,
– the number of permanently incontinent children diminished,
– it contributed to the development of social continence and adapted bladder function, a factor facilitating daily life and
– determining the quality of life.

2.5. On the basis of our clinical examinations we made the following **new statements**: Conductive education is a **comprehensive development procedure based on cognitive activity and learning**. Its **employment is safe if the pedagogical work is supported by a multidisciplinary working team** while promoting the development of multiple risk (SB) children.

It is essential to emphasise that even considering precluding circumstances and with careful **multidisciplinary** control and urological care, the range of cases where voluntary urination may be applied is limited. Under no circumstances do we aim at extending the use of the procedure or combining it with some other method.

New results

1. The correlation between the socioeconomic status of the mother and NTD is rather limited and not characteristic of NTD.
2. The periconceptional use of folic acid and multivitamins occurs more frequently among intellectuals and managers.
3. The effect of the socioeconomic status on the origin of NTD is not significant in Hungary but a higher socioeconomic status may contribute to the primary prevention of NTD.
4. The higher prevalence of acute maternal abnormalities in the NTD group may be mainly a consequence of recall bias. The possible role of hyperthermia, however, may not be precluded in the origin of NTD. In addition to that, migraine/headache may correlate with the development of NTD, especially in cases of anencephaly but this correlation needs confirmation by further research.
5. Drugs taken during pregnancy do not contribute considerably to the occurrence of isolated neural tube defect but certain medicines have a part in the origin of such disturbances.
6. In cases of neurogenic bladder voluntary urination can be achieved through a learning process in the course of conductive education. The correlation between the learning of

conditioning and the decrease of residual urine is highly significant (p=0.0001), thus the frequency of urine infections changes favourably already by the fourth month of conditioning: a correlation of high significance is present (p=0.0001). Unjustifiably frequent, routine catheterisation may be reduced or prevented (67% of the children perform conditioning independently). The development of social continence correlates significantly with conductive education (p=0.02).

7. As a result of conductive education, the majority of children awaiting integration into a kindergarten or school (67% of the study group) can void urine (perform urination conditioning) independently under permanent urological control. This is a relevant factor of their socialisation, shaping also the sense of order and the demand for personal hygiene. Its primary preventive effect evolves as it prevents the development of inferiority complex, isolation and personality disorders originating from neurological damage.

Conductive education realises **operant learning**, teaching the conditioning of needs (in the present case urination in cases of spinal laesion caused by NTD and neurogenic bladder). Apart from that it achieves **insight learning** in solving new task situations, promoting the *shaping and firming of associative relations*. The *output*, the process of *voluntary* urination is attained in spite of the fact that *irreversible neurological damage to the sensory receptors, part of the afferent/efferent paths and the spinal centre of urination is provable*. The response, i.e. voluntary urination can be performed without sensory stimulation, in spite of partly or fully lacking innervation. Necessary **conditions** are on one hand **intact afferent and efferent paths between the spinal centre of urination and the cortex and on the other hand active participation in the learning process during execution**.

It has been proved that, apart from *voluntary urination* (urination conditioning) the demand for *personal hygiene* and a *regimen of life* (circadian rhythm with set times) can be shaped as a result of cognitive activity, through a **learning process**. Reinforcing self confidence, these factors determine the **personality development** of spina bifida children and are vital for their **socialisation**.

Practical consequences

1. Conductive education is ***compatible*** **with any other educational or rehabilitational procedure**. Further research into the cognition and learning based conductive method of promoting development (intending) is imperative (fMRI, PET, MEP).
2. Achieving a **better quality of life** and maintaining it in the long term is only possible if the **promotion of development** is ***permanent***: neurotherapy or active neurohabilitation is succeeded by conductive education and if necessary, special or differentiated education.
3. In order to achieve their **common aim**, the optimal condition of patients with multiple disorders, it would be desirable if professionals involved in neurorehabilitation would work in **close and continuous co-operation**.

Summary

The objective of our research was to demonstrate the role of the cognition and learning based promotion of development in the conductive education process.

Our intention was to prove the existence of the learning process by studying urination conditioning (neurogenic bladder) in 112 children with SB (age range: 2-7 years). The condition of the urinary tract is a factor that limits the lives of SB children. In order to protect the children, the status of the urinary tract was regularly checked by urologists in our multidisciplinary team. In compliance with the urological protocol the occurrence of vesicoureteral reflux (VUR), the amount of retention, the occurrence of urinary tract infections and the development of social continence were assessed. 61.5% of the children had developed VUR prior to the onset of conductive education (by the age of 3 years). Due to the more effective voiding of the bladder, as a result of conditioning the retention showed a considerable decrease ($p<0,0001$) and the occurrence of urinary tract infections diminished significantly ($p<0,0001$) by the fourth month of the conditioning practice. By the end of the conductive education period 67% of the kindergarten age SB children were capable of emptying their bladder independently, thus routine catheterisation could be avoided. In 26% of the cases urination conditioning was combined with intermittent catheterisation. The number of cases showing social continence (continence exceeding 2 hours) presents a significant correlation with the performance preceding conductive education ($p=0.02$).

Taking the neurogenic bladder caused by irreversible neurological damage (SB) as a model (under careful multidisciplinary prevention), our study demonstrated the effect of conductive education which is based on cognitive activity and the learning process.

We advise against applying the method (voluntary urination) as a routine procedure or in combination with some other method without medical care.

Publications related to the subject of the present paper

1. **Medveczky E**., és mtsai : Spina bifidás óvodások multidiszciplináris ellátása a Mozgássérültek Petõ András Nevelõképzõ és Nevelõintézetében. Ajánlás a konduktív nevelés hatékonyságának követésére.
   Magyar Pediáter, 23, 24-27. 1989.

2. Balogh E., **Medveczky E**., Halász A.: Vezetõ motoros diszfunkciók és epilepszia.
   Magyar Pediater 26. 34-36. l992.

3. **Medveczky E**.: Orthopédiai konzekvenciák cerebrális parézis esetén
   Pediáter XI./1. 45-50. 2002.

4. **Medveczky E**., Mészáros J., Puhó E., Czeizel E.: Az anya terhesség alatti gyógyszerszedése, mint kockázati tényezõ a velõcsõ-záródási zavarok kialakulásában.
   Orvosi Hetilap (accepted for publication 2003)

5. **Medveczky E**., Mészáros J., Puhó E.,: Az anya terhesség alatti gyógyszerszedése, mint kockázati tényezõ a velõcsõzáródási zavarok kialakulásában.
   Orvosi hetilap (accepted for publication 2003)

6. **Medveczky E**., Puhó E., Czeizel E.: A szülõk szocioökonómiai helyzete a velõcsõ-záródási zavarok kialakulásában. Magyar Nõorvosok Lapja (submitted for publication 2003)

7. **Medveczky E**., Puhó E., Czeizel EA.: The use of drugs in mothers of offspring with neural-tube defects. Pharmacoepidemiology and Drug Safety (accepted for publication 2003)

8. **Medveczky E**., Puhó E., Czeizel EA.: An evaluation of maternal illnesses in the origin of neural-tube defects. Archives of Gynecology and Obstetrics (accepted for publication 2003)

9. **Medveczky E**.: A gyermekkori központi idegrendszeri eredetû sérülés fejlesztésének lehetõségei konduktív neveléssel. In: Várkonyi Á.: Különleges Bánásmódot igénylõ Gyermekek. Semmelweis Egyetem, Budapest (megjelenés alatt 2003)

10. **Medveczky E**.: A konduktív Nevelés Pedagógiai és Orvosbiológiai Alapjai.
    ISBN 9632104986 NPI, Budapest (megjelenés alatt 2003)

11. **Medveczky E**.: A Konduktív Nevelés. (megjelenés alatt 2003)

12. **Medveczky E**.: Conductive Education and Neurorehabilitation. International Petõ Association and Aquinas Collage Michigan, Grand Rapids (in press 2003)

13. **Medveczky E**.: Conductive education. Occasional Papers Trentham Books, London (in press 2003)

14. **Medveczky E.**: Tanulási folyamat a konduktív nevelésben. Magyar Pedagógia (publikálásra elõterjesztve 2003)

15. **Medveczky E.**: The Biological Theory of Conductive Education. Occasional Papers of Conductive Education, Trentham Books, London (in press 2003)

16. **Medveczky E.**: A konduktív nevelés. 110 éve született Petõ András a konduktív pedagógia megteremtõje. Nõvér (accepted for pulication 2003)

17. **Medveczky E.**: Fejlõdéstan: A központi Idegrendszer Fejlõdési Zavarainak Oktatása a Konduktív Pedagógiában. MPANNI, Budapest (megjelenés alatt)

18. **Medveczky E.**: A Petõ Intézet és a konduktív pedagógia története. Pediáter, Budapest VII/4. 340-342. 1998.

19. **Medveczky E.**: Konduktív nevelés az ezredfordulót követõen. Fejlesztõ Pedagógia (accepted for publication 2003)

Abstracts underlying the present paper

1. **Medveczky E.**, Balogh E.: Judgement of effectiveness of conductive education in MMC children. European Journal of Pediatric Surgery, London Suppl. 1. 37-38. 1993.

2. **Medveczky E.**, Hári M., Balogh E.: The rule of conductive education in the rehabilitation of children with MMC. European Journal of Pediatric Surgery, London Suppl. 1. 37-38. 1993.

3. **Medveczky E.**, Balogh E.: Antropological datas and peripheral nerve functions in spina bifida children. Human Biologica 24. NOTA, Budapest 27. 1994.

4. **Medveczky E.**, Halász A.: Epilepsy of shunted and non-shunted hydrocephalus patients. Developmental Medicine and Child Neurology, London, Mac Keith Press, 37: 3. 1995.

5. **Medveczky E.**, Horváth J., Balogh E.: Epilepsy in hemiplegic cerebral palsied children. Monatschrift Kinderheilkunde 143: 913-950. 1995.

6. **Medveczky E.**: Epilepsy in congenital hemiparetic children. Convened by SCOPE Partnership with International Petõ Association, III. rd World Congress of Conductive Education Urakawa, Japán, Study Abstract Paper 91-93. 1999.

7. Balogh E.-**Medveczky E.**: A cerebralis paresisrõl. Pediater XI. évf./l 45-50. 2002.

8. **Medveczky E.**: Model of learning process in conductive education. Conductive Education Worldwide, Science and Quality. (accepted for publication 2003)

Relevant lectures on the present subject

1. **Medveczky E.**: L´Education Conductive Comme Rehabilitation et Des Domaines Limites. Association Des Paralyses De France, Toulon, 14-16. Oct. l994.

2. **Medveczky E.**, Beck É.: The role of conductive education in the rehabilitation of meningomyelocele patients. 6th European Regional Conference of Rehabilitation International, Budapest Sept. 4-9. l994

3. **Medveczky E.**, Tímár K., Balogh E.: Biomedical aspect of conductive education in meningomyelocele patients. 6th European Regional Conference of Rehabilitation International, Budapest, Sept. 4-9. l994.

4. **Medveczky E.**, Balogh E.: Antropometrical data and peripheral nerve functions in spina bifida. 7th International Congress of Auxology, Budapest 1994.

5. **Medveczky E.**: Interdisciplinary care of cerebral palsied children in conductive education. 2 nd World Congress on Conductive Education, Budapest, Sept. 10-13. 1995

6. **Medveczky E.**, Halász A.: Epilepsy of shunted and non-shunted hydrocephalus patients The 1st Interim Meeting of the European Society for Paediatric Neurosurgery, Eilat, Marz. 19-23. l995

7. **Medveczky E.**, Horváth J., Balogh E.: Epilepsy in hemiplegic cerebral palsied children. Jahrestagung der Gesellschaft für Neuropadiatrie, Düsseldorf, 20-22. Oct. Monatsschrift Kinderheilkunde l43: 913-950. 1995.

8. **Medveczky E.**: Epilepsy in congenital hemiparetic children. Convened by SCOPE Partnership with International Petõ Association, World Congress Urakawa, Japan , Study Abstract Paper of World Congress 91-93.1999.

9. **Medveczky** E.: Convulsive disorders in children with cerebral paresis. Qeen Mary University of London, Convened by SCOPE Partnership with International Petõ Association, 9-14 Sept. 2001.

10. **Medveczky E.**: Convulsive disorders in children with cerebral paresis. Qeen Mary University of London, Convened by SCOPE Partnership with International Petõ Association, 9-14 Sept. 2001.