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1: Int J Rehabil Res. 2008 Jun;31(2):185-188.

The six-minute walk test for children with cerebral palsy.

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The 6-min walk test (6MWT) is increasingly being used as a measure of 'functional ability' in young people with cerebral palsy, despite a lack of published evidence that it is reliable for this population. This study aimed to determine the test-retest reliability of the 6MWT for ambulant 11-17-year-old adolescents with cerebral palsy. Adolescents with cerebral palsy were invited to participate in a single testing session. They performed the 6MWT twice under controlled conditions (standardized 10 m course layout, standardized instructions and encouragement), with a 30-min rest. Forty-one participants (response rate 36.6%) were recruited (26 males, 15 females; mean age 13.6 \pm 1.6 years). No significant difference was found between the 6-min walk distance in trials 1 and 2 for the whole group (448.7 \pm 96.9 m vs. 449.5 \pm 102.1 m; $P=0.81$) or by sex and gross motor function subsets. The test-retest intraclass correlation coefficient was 0.98. Bland-Altman analyses revealed a bias of only -0.9 m, and that in 95% of cases, the second 6-min walk distance would fall within \pm 43.1 m of the first 6-min walk distance. All participants successfully managed the testing procedure, appeared to understand what was expected of them, and experienced no ill effects from the 6MWT. These results indicate that, when carried out according to American Thoracic Society guidelines, the 6MWT is a reliable test for young ambulant people with cerebral palsy.

PMID: 18467936 [PubMed - as supplied by publisher]



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2: Int J Rehabil Res. 2008 Jun;31(2):119-129.**The International Classification of Functioning, Disability and Health environmental factors as facilitators or barriers used in describing personal and social networks: a pilot study of adults with cerebral palsy.**

Jönsson G, Ekholm J, Schult ML.

aStockholm Rehabilitation Medicine University Clinic, Danderyd Hospital bDivision of Rehabilitation Medicine, Department of Public Health Sciences cSection of Rehabilitation Medicine, Department of Clinical Sciences Danderyds Hospital, Karolinska Institutet, Stockholm, Sweden.

Using the environmental factors of the International Classification of Functioning, Disability and Health (ICF), the aim of the study was to describe the social networks involved in the everyday lives of adults with cerebral palsy (CP). A further aim was to use the ICF generic scale to describe how far these adults experienced the contacts within these networks as facilitators or barriers. Sixteen adults with CP, including nine women, with a mean age of 32 years were interviewed. The interviews were performed using a guide based on the component environmental factors of the ICF. The participants described (ICF codes e310-e360) 85 contacts in the domain of 'support and relationships' as substantial facilitators (md=3.5), and 45 as both moderate-to-substantial facilitators and barriers (md=2.5). Four contacts were considered as barriers. The participants described (ICF codes e410-e455) 88 contacts in the domain of 'attitudes' as substantial facilitators (md=3) and 36 contacts as both moderate barriers and facilitators (md=2). Another four contacts were considered as moderate-to-severe barriers (md=2.5). Within the domain 'services, systems and policies' (e535-e590), the participants described 123 facilitators, the majority considered as substantial, 37 considered as both moderate facilitators and barriers and one considered as a complete barrier. The result of this pilot study contributes new information concerning the contact networks of adults with CP. It indicates new possibilities for using the ICF environmental factors and the 1-4 scale of facilitators and barriers in clinical work. The participants felt the majority of the contacts in their networks to be supportive, whereas some were felt to be both facilitators and barriers.

PMID: 18467926 [PubMed - as supplied by publisher]

3: Adv Med Sci. 2008 Apr 18;:1-7 [Epub ahead of print]**Clinical and neuroimaging profile of congenital brain malformations in children with spastic cerebral palsy.**

Kułak W, Sobaniec W, Gościak M, Oleński J, Okurowska-Zawada B.

Department of Pediatric Rehabilitation, Medical University of Białystok, Białystok, Poland.

Purpose: Analysis of the incidence of congenital brain malformations in children with spastic cerebral palsy (CP) in a hospital-based study. **Material and Methods:** The present study included 74 boys and 56 girls with spastic tetraplegia, diplegia, and hemiplegia CP. Magnetic resonance imaging MRI findings were analyzed in children with CP. **Results:** Significant abnormalities relevant to the CP were evident on MRI in 124 (95.3%) subjects. Periventricular leukomalacia (PVL) was detected more frequently in children with spastic diplegia than in patients with tetraplegia or hemiplegia. Cerebral atrophy was found more often in the tetraplegic group compared to the diplegic patients. Porencephalic cysts were detected more often in children with spastic hemiplegia. Congenital brain anomalies were evident in 15 (10.7%) children with spastic CP. Brain malformations included: schizencephaly (5), agenesis corpus callosum (4), polymicrogyria (2), holoprosencephaly (2) and lissencephaly (2). Intractable epilepsy and mental retardation were observed more often in children with brain anomalies. Twelve patients with congenital brain malformations were born at term and three born at preterm. **Conclusions:** Neuroimaging results in children with CP may help determine the etiology and make better prognosis of CP.

PMID: 18467267 [PubMed - as supplied by publisher]

4: Eur J Pharmacol. 2008 Apr 8 [Epub ahead of print]

Agomelatine, a melatonin receptor agonist with 5-HT(2C) receptor antagonist properties, protects the developing murine white matter against excitotoxicity.

Gressens P, Schwendimann L, Husson I, Sarkozy G, Mocaer E, Vamecq J, Spedding M.

Inserm, U676, Paris, F-75019, France; Université Paris 7, Faculté de Médecine Denis Diderot, IFR02 and IFR25, Paris, France; AP HP, Hôpital Robert Debré, Service de Neurologie Pédiatrique, Paris, France; PremUP, Paris, France.

Periventricular leukomalacia is a major cause of cerebral palsy. Perinatal white matter lesions associated with cerebral palsy appears to involve glutamate excitotoxicity. When injected intracerebrally into newborn mice, the glutamatergic analog, ibotenate, induces white matter cysts mimicking human periventricular leukomalacia. Intraperitoneal injection of melatonin was previously shown to be neuroprotective in this mouse model. The goal of the present study was to compare in this model the protective effects of agomelatine (S 20098), a melatonin derivative, with melatonin. Mice that received intraperitoneal S 20098 or melatonin had significant reductions in size of ibotenate-induced white matter cysts when compared with controls. Although agomelatine and melatonin did not prevent the initial appearance of white matter lesions, they did promote secondary lesion repair. Interestingly, while melatonin effects were only observed when given within the first two hours following the excitotoxic insult, agomelatine was still significantly neuroprotective when administered eight hours after the insult. The protective effects of agomelatine and melatonin were counter-acted by co-administration of luzindole or S 20928, two melatonin receptor antagonists. Agomelatine, acting through melatonin receptors, could represent a promising new drug for treating human periventricular leukomalacia and have beneficial effects on neuroplasticity.

PMID: 18466899 [PubMed - as supplied by publisher]

5: Augment Altern Commun. 2008;24(2):110-22.

'I've Got Something to Say': Interaction in a Focus Group of Adults with Cerebral Palsy and Complex Communication Needs.

Hemsley B, Balandin S, Togher L.

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This paper describes the outcomes of a pilot study examining the roles of the moderator and participants in one focus group of six adults with complex communication needs. In the group, participants used a variety of communication methods including AAC and dysarthric speech. An analysis of the focus group interaction revealed that (a) both the moderator and participants played an active role in clarifying and repairing communication in the group, and (b) the group interacted successfully to discuss the focus group questions. The implications of the study for moderators and including adults with complex communication needs in focus groups are discussed, and directions for future research are suggested.

PMID: 18465365 [PubMed - in process]

6: Gynecol Obstet Fertil. 2008 May 5 [Epub ahead of print]

D. Philopoulos answers C. Racinet with regards to his article: Is cerebral palsy preventable? [Article in French]

Philopoulos D.

18, rue Vignon, 75009, Paris, France.

Publication Types:
EDITORIAL

PMID: 18462979 [PubMed - as supplied by publisher]

7: J Rehabil Med. 2008 May;40(5):347-54.

Needs, problems and rehabilitation goals of young children with cerebral palsy as formulated in the rehabilitation activities profile for children.

Nijhuis BJ, Reinders-Messelink HA, de Blécourt AC, Ties JG, Boonstra AM, Groothoff JW, Nakken H, Postema K.

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OBJECTIVE: To describe the content of needs, problems and goals of 41 Dutch children with cerebral palsy using the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY) as a classification system. To evaluate the adherence of formulations of needs, problems and goals to specifications of the Rehabilitation Activities Profile for Children. **METHODS:** Raw text data were extracted and organized. Two raters independently weighed the entries' quality against the specifications and linked the extracted content to ICF-CY categories. **RESULTS:** In 12% of the reports no needs, and in 24% no principal goals, were formulated. Needs mostly pertained to the activities-and-participation domain (65%), whereas problems and goals covered all 3 ICF-CY domains. None of the needs were prioritized and 79% met the quality criterion of description of a problem/desire. Twenty-four percent of the problems were described in the activity-and-participation domain and 83% referred to a treatable problem. Fifty-six percent of the goals were formulated in terms of intended result/effect and 63% as child/parent actions. **CONCLUSION:** Insight is provided into the content of rehabilitation programmes for children with cerebral palsy. To optimize the quality of the reports, research on reasons for non-adherence to specifications of the Rehabilitation Activities Profile is needed.

PMID: 18461259 [PubMed - in process]

8: Appl Physiol Nutr Metab. 2008 Jun;33(3):547-61.Related Articles, Links

Canadian Society for Exercise Physiology position paper: resistance training in children and adolescents.

Behm DG, Faigenbaum AD, Falk B, Klentrou P.

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Many position stands and review papers have refuted the myths associated with resistance training (RT) in children and adolescents. With proper training methods, RT for children and adolescents can be relatively safe and improve overall health. The objective of this position paper and review is to highlight research and provide recommendations in aspects of RT that have not been extensively reported in the pediatric literature. In addition to the well-documented increases in muscular strength and endurance, RT has been used to improve function in pediatric patients with cystic fibrosis and cerebral palsy, as well as pediatric burn victims. Increases in children's muscular strength have been attributed primarily to neurological adaptations due to the disproportionately higher increase in muscle strength than in muscle size. Although most studies using anthropometric measures have not shown significant muscle hypertrophy in children, more sensitive measures such as magnetic resonance imaging and ultrasound have suggested hypertrophy may occur. There is no minimum age for RT for children. However, the training

and instruction must be appropriate for children and adolescents, involving a proper warm-up, cool-down, and appropriate choice of exercises. It is recommended that low- to moderate-intensity resistance exercise should be done 2-3 times/week on non-consecutive days, with 1-2 sets initially, progressing to 4 sets of 8-15 repetitions for 8-12 exercises. These exercises can include more advanced movements such as Olympic-style lifting, plyometrics, and balance training, which can enhance strength, power, coordination, and balance. However, specific guidelines for these more advanced techniques need to be established for youth. In conclusion, an RT program that is within a child's or adolescent's capacity and involves gradual progression under qualified instruction and supervision with appropriately sized equipment can involve more advanced or intense RT exercises, which can lead to functional (i.e., muscular strength, endurance, power, balance, and co-ordination) and health benefits.

PMID: 18461111 [PubMed - in process]

9: Acta Paediatr. 2008 Jun;97(6):714-9.

Neonatal resuscitation after severe asphyxia - a critical evaluation of 177 Swedish cases.

Berglund S, Norman M, Grunewald C, Pettersson H, Cnattingius S.

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Aim: To evaluate neonatal resuscitation of infants born with severe asphyxia. **Method:** All case records of the 472 claims for financial compensation due to suspected medical malpractice in conjunction with childbirth in Sweden between 1990 and 2005 were scrutinized. Inclusion criteria were: gestational age ≥ 33 completed weeks, planned vaginal onset of delivery, a reactive CTG at onset of labour, neonatal asphyxia (defined as metabolic acidosis {pH of < 7.05 and/or a base excess of < -12 }), or an Apgar score < 7 at 5 min. It was assessed that 177 infants suffered from cerebral palsy or early death due to severe asphyxia presumably caused by malpractice around labour. **Results:** Median Apgar score at 5 min was 3, indicating that all infants needed immediate and extensive resuscitation. There was insufficient adherence to guidelines concerning neonatal resuscitation, including delayed initiation of excessive resuscitation in 19 infants, lack of satisfactory ventilation in 79 infants, and untimely interruption of resuscitation in 38 infants. **Conclusions:** Compliance with guidelines for resuscitation of severely asphyctic newborn may be improved, especially concerning ventilation and prompt paging for skilled personnel in cases of imminent asphyxia. Documentation of neonatal resuscitation must be improved to enable reliable evaluation.

PMID: 18460105 [PubMed - in process]

10: Dis Esophagus. 2008 May 2 [Epub ahead of print]

Total esophagogastric dissociation in adult neurologically impaired patients with severe gastroesophageal reflux: an alternative approach.

Hazebroek EJ, Hazebroek FW, Leibman S, Smith GS.

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Patients with neuromuscular impairment, such as cerebral palsy or myotonic dystrophy, often suffer from oropharyngeal neuromuscular incoordination and severe gastroesophageal reflux (GER). In 1997, Bianchi proposed total esophagogastric dissociation (TEGD) as an alternative to fundoplication and gastrostomy to eliminate totally the risk of recurrence of GER in neurologically impaired children. Little information exists about the best management for adult patients with severe neurological impairment in whom recurrent GER develops after failed fundoplication. We present our experience in three adult patients with neurological impairment in whom TEGD with Roux-en-Y esophagojejunostomy and feeding gastrostomy was performed for permanent treatment of GER.

PMID: 18459984 [PubMed - as supplied by publisher]

11: Neurology. 2008 May 6;70(19):1691-8.

Assessment: Botulinum neurotoxin for the treatment of spasticity (an evidence-based review): report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology.

Simpson DM, Gracies JM, Graham HK, Miyasaki JM, Naumann M, Russman B, Simpson LL, So Y; Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology.

Department of Neurology, Mount Sinai Medical Center, New York, NY, USA.

OBJECTIVE: To perform an evidence-based review of the safety and efficacy of botulinum neurotoxin (BoNT) in the treatment of adult and childhood spasticity. **METHODS:** A literature search was performed including MEDLINE and Current Contents for therapeutic articles relevant to BoNT and spasticity. Authors reviewed, abstracted, and classified articles based on American Academy of Neurology criteria (Class I-IV). **RESULTS:** The highest quality literature available for the respective indications was as follows: adult spasticity (14 Class I studies); spastic equinus and adductor spasticity in pediatric cerebral palsy (six Class I studies). **RECOMMENDATIONS:** Botulinum neurotoxin should be offered as a treatment option for the treatment of spasticity in adults and children (Level A).

PMID: 18458229 [PubMed - in process]

12: Am J Obstet Gynecol. 2008 May;198(5):509.e1-8.

Mannose-binding lectin haplotypes may be associated with cerebral palsy only after perinatal viral exposure.

Gibson CS, MacLennan AH, Goldwater PN, Haan EA, Priest K, Dekker GA; South Australian Cerebral Palsy Research Group.

Collaborators (10)

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OBJECTIVE: The objective of the study was to investigate the associations between infection, polymorphisms in the mannose-binding lectin gene (MBL), and cerebral palsy (CP). **STUDY DESIGN:** This was a case-control study using deoxyribonucleic acid from newborn screening cards of 443 Caucasian CP cases and 883 Caucasian controls to screen for 6 polymorphisms within the MBL gene. These polymorphisms combine to create haplotypes with high (HYPA), intermediate (LYQA, LYPA), low (LXPA), and defective (HYPD, LYQC, LYPB) circulating MBL levels. **RESULTS:** chi(2) Analyses demonstrated significant differences between CP cases and controls (less than 37 weeks chi(2) 14.99, P = .02; less than 32 weeks chi(2) 13.62, P = .02). The MBL haplotype LYPA was associated with CP at all gestations (odds ratio [OR] 1.57, 95% confidence interval [CI], 1.00 to 2.46), less than 37 weeks (OR 2.43, 95% CI, 1.41 to 4.18), and less than 32 weeks (OR 2.54, 95% CI, 1.34 to 4.76). LYPA was also associated with hemiplegic CP for babies born at less than 37 weeks (OR 2.77, 95% CI, 1.02 to 7.26) and less than 32 weeks (OR 4.48, 95% CI, 1.55 to 12.65). HYPD was associated with quadriplegic CP at all gestations (OR 3.47, 95% CI, 1.41 to 8.31) as well as for babies born at less than 32 weeks (OR 7.86, 95% CI, 1.67 to 29.48). Subanalysis on samples previously testing positive for exposure to viral infection demonstrated similar patterns of significance as those presented above, whereas analysis on samples negative for exposure to viral infection showed no positive associations between any of the MBL haplotypes and CP. Potential type I error from multiple analyses is a caveat. **CONCLUSION:** MBL haplotypes LYPA or HYPD may be associated with an increased risk of CP in the presence of exposure to viral infection and may act as susceptibility factors for CP.

Publication Types:
Research Support, Non-U.S. Gov't

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13: Am J Obstet Gynecol. 2008 May 1 [Epub ahead of print]

Neurodevelopmental outcome of premature infants after exposure to antenatal indomethacin.

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Department of Pediatrics, Golisano Children's Hospital at Strong, University of Rochester Medical Center, Rochester, NY.

OBJECTIVE: This study was undertaken to evaluate the effect of antenatal indomethacin exposure on neurodevelopmental outcomes of premature infants. **STUDY DESIGN:** A retrospective cohort study was performed to compare neurodevelopmental outcomes between premature infants exposed to antenatal indomethacin and infants unexposed to antenatal indomethacin. Inclusion criteria included all 23-29 weeks' gestational age infants delivered between January 1998 and December 2002 who had neurodevelopmental evaluation performed at 16-24 months corrected age. Outborn infants and those with major congenital malformations or chromosomal problems were excluded. Continuous and categorical variables were analyzed by using t test and chi(2) test, respectively. **RESULTS:** A total of 255, 23-29 weeks' gestational age infants were delivered between January 1998 and December 2002. Of the 87 infants who met inclusion criteria, 29 infants were exposed to antenatal indomethacin (mean dose 267 mg and median duration 3 days) and 58 infants were unexposed to antenatal indomethacin. There were no significant differences between the 2 groups in clinical characteristics, except for gestational age, mode of delivery, and antenatal steroid exposure. There was no significant difference in major neurosensory abnormality (cerebral palsy and/or deafness and/or blindness); however, the proportion of infants with subnormal Bayley-Mental Developmental Index (70 or less) and neurodevelopmental impairment (neurosensory abnormality and/or Mental Developmental Index 70 or less) was significantly less in the group exposed to antenatal indomethacin compared with unexposed group. When controlled for confounders including antenatal steroids, antenatal indomethacin was not associated with Mental Developmental Index 70 or less (odds ratio 0.44, 95% confidence interval 0.12-1.5) and neurodevelopmental impairment (odds ratio 0.4, 95% confidence interval 0.13-1.2) by using logistic regression. Subgroup analysis of 12 infants exposed to antenatal indomethacin within 48 hours of birth was not associated with neurodevelopmental impairment (odds ratio 0.2, 95% confidence interval 0.03-1.02) compared with unexposed group. **CONCLUSION:** Antenatal indomethacin is not associated with abnormal neurodevelopmental outcome in infants 29 or less weeks' gestational age.

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14: J Midwifery Womens Health. 2008 May-Jun;53(3):227-35.

Clinical management of intra-amniotic infection and chorioamnionitis: a review of the literature.

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Intra-amniotic infection (IAI), or chorioamnionitis, complicates up to 10% of all pregnancies and up to 2% of labors at term. There is a significant risk of complications for the mother and the neonate following IAI, including sepsis and pneumonia. In addition, there is a correlation between IAI and premature rupture of membranes, preterm premature rupture of membranes, preterm labor, and preterm birth. Research in the last decade has also revealed a complex and significant association between IAI and cerebral palsy and other central nervous system damage in both the preterm and term fetus. Timely diagnosis and

treatment of IAI can significantly reduce the risk of both maternal and neonatal complications.

PMID: 18455097 [PubMed - in process]

15: Acta Chir Orthop Traumatol Cech. 2008 Apr;75(2):117-22.

Neuromuscular deformity of the pelvis and its surgical treatment. [Article in Czech]

Repko M, Krbec M, Chaloupka R, Tichý V, Sprláková-Puková A.

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PURPOSE OF THE STUDY To evaluate the efficacy of surgical treatment in pelvic deformities associated with neuromuscular spine deformity, using radiographic parameters and clinical outcome analysis. In the lumbo-pelvic region, spinal deformity is most frequently combined with pelvic obliquity, lumbar hyperlordosis, hip deformity and leg-length discrepancy. Pelvic deformities include an excessive posterior or anterior pelvic tilt, obliquity or rotation and windblown hip syndrome. **MATERIAL AND METHODS** In the period from 1994 to 2006, 42 paediatric patients (28 girls and 14 boys) underwent surgical correction of spine and pelvic deformities by the Luque-Galveston technique. The group included 25 patients with an underlying diagnosis of a spastic form of cerebral palsy, seven patients affected by paralysis, six with Duchenne muscular dystrophy and four with spinal muscular atrophy. The average age at the time of surgery was 14 years and 3 months and the patients were followed-up for 7 years and 5 months on the average. The results were evaluated on the basis of findings on antero-posterior and lateral radiographs including the pelvis, hip joints and the whole spine. The patients were examined before surgery, then immediately after it, and at yearly follow-up intervals. **RESULTS** The mean pre-operative pelvic obliquity was 37 degrees (+/-6.0) and it improved to 9 degrees (+/-4.5) post-operatively. Horizontalization of the sacrum was corrected from the mean preoperative value of 19 degrees (+/-5.0) to 37 degrees (+/-6.1) post operatively. This difference was statistically significant ($p=0.001$). Scoliosis curve correction achieved by the surgery was from 79 degrees (+/-21.3) pre-operatively to 35 degrees (+/-14.5) post-operatively, with a mean correction rate of 56 %. The following complications were recorded: faulty insertion of the pelvic fixation resulting in perforation of the medial cortical substance of the iliac crest in one patient, pseudoarthrosis in the region of thoraco-lumbar junction in two patients, instrumentation failure with the need of pseudoarthrosis resection and re-instrumentation in one patient, and deep infection requiring wound irrigation and longterm antibiotic therapy. **DISCUSSION** The surgical correction of pelvic deformity is always associated with operative treatment of scoliosis. However, the procedure is regularly preceded by surgical correction of muscular imbalance of the lower limbs and pelvis and of hip deformities. The surgical stabilization of spinal and pelvic deformities brings about the loss of some alternative motor stereotypes. This disadvantage is compensated for by a better sitting stability and better prospects for prosthetic care. **CONCLUSIONS** The radiographic and clinical findings in the patients treated showed good correction of pelvic deformities in the frontal and sagittal planes. Pelvic obliquity correction thus contributes to the improvement of sitting stability in physically disabled patients. **Key words:** pelvic deformities, neuromuscular scoliosis, surgery.

Publication Types:
English Abstract

PMID: 18454916 [PubMed - in process]

16: Acta Chir Orthop Traumatol Cech. 2008 Apr;75(2):106-9.

Efficacy of antiseptics in the prevention of post-operative infections of the proximal femur, hip and pelvis regions in orthopedic pediatric patients. Analysis of the first results. [Article in Slovak]

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PURPOSE OF THE STUDY In orthopedics an infected operative wound always presents a serious complication that, apart from many adverse effects on the patient, increases the costs of therapy. The aim of this study was to analyze the effectiveness of antiseptic agents in the prevention of postoperative complications associated with surgery on the proximal femur, hip and pelvis in children. **MATERIAL** This prospective randomized study included 162 patients with the following diagnoses: cerebral palsy, developmental hip dysplasia, Perthes' disease, epiphyseolysis of the femoral head, and tumors. A total of 182 surgical procedures were carried out on soft and bone tissues in the proximal femur, hip and pelvis regions. The patients were allocated to two groups according to the intra-operative conditions used. Group 1, including 89 patients, was treated with 3.5 % solution of betadine before final closing of the wound and group 2, comprising 73 patients, received no betadine irrigation during the intraoperative period. The other operative and post-operative conditions provided for the patients were identical; surgery was carried out in one operating theatre without laminar air flow. **RESULTS** The average follow-up was 7.8 months (range, 2-14 months). No infected operative wound was observed in group 1, and two superficial wound infections were recorded in group 2. **CONCLUSIONS** The first results of our study suggest the need of prophylactic intra-operative irrigation of wounds in the hip and pelvis region. Irrigation with a diluted betadine solution is indicated in accord with the risk factors of the patient's diagnosis and the site of surgery, and also when the operative time is longer, there is insufficient protection with single-use surgical towelings, laminar air flow is present in the operating theatre or for other reasons. **Key words:** prevention of infection, antiseptics, surgery, betadine irrigation.

Publication Types:
English Abstract

PMID: 18454914 [PubMed - in process]

17: J Neurosurg Pediatrics. 2008 Mar;1(3):178; discussion 178-9.

Comment on:
J Neurosurg Pediatrics. 2008 Mar;1(3):180-6.

Selective dorsal rhizotomy and the challenge of monitoring its long-term sequelae.
Albright AL.

Comment on:
J Neurosurg Pediatrics. 2008 Mar;1(3):180-6.

Selective dorsal rhizotomy.
Engsberg, JR, Park TS.

Publication Types:
Comment
Editorial



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