2012

I am very interested in the long term outcomes of people with disabilites, including the long term outcomes of infants born prematurely. In doing research for an article on screening, I came across the above gem and was very surprised to see the risk that affects an infant even if their birth was only moderately early. This is concerning as the infants born 'older' are often not targeted for follow-up screening; or may not qualify for services as they often appear to be doing well as infants.

In a second study by the same group, long term follow-up also focused on additional issues that affect infants born preterm.

Ekeus C, Lindström K, Lindblad K, Rasmussen F, Hjern A, **Preterm Birth, Social Disadvantage, and Cognitive Competence in Swedish 18- to 19-Year-Old Men.** *Pediatrics* 2010;125;e67

paper can be accessed at: http://pediatrics.aappublications.org/content/125/1/e67.full.html

Preterm Infants as Young Adults: A Swedish National Cohort Study

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The authors have indicated they have no financial relationships relevant to this article to disclose.

ABSTRACT

OBJECTIVE. Increasing numbers of infants born preterm survive into adulthood. In this study, we analyzed the effect of having been born preterm on disability and vocational success in young adults.

METHODS.A Swedish national cohort of 522 310 infants born in 1973–1979 were followed up for disabilities and income in national registers in 2002 at the age of 23 to 29. Hypotheses were tested in multivariate analysis with logistic regression

models on the log scale for dichotomized outcomes and linear regression for continuous variables.

RESULTS. There was a stepwise increase in disability in young adulthood with increasing degree of preterm birth. A total of 13.2% of children born at 24 to 28 weeks' gestation and 5.6% born at 29 to 32 weeks' gestation received economic assistance from society because of handicap or persistent illness, which is equivalent to nearly 4 times the risk of those born at term after adjustment for socioeconomic and perinatal confounders. Moderate (33–36 weeks' gestation) and marginal (37–38 weeks' gestation) preterm birth also carried significantly increased risks for disability and were responsible for 74% of the total disability associated with preterm birth. Preterm birth was associated with a lower chance of completing a university education and a lower net salary in a stepwise manner. The total economic gain for Swedish society, in terms of taxes and decreased costs for benefits, if all long-term effects of preterm birth could have been prevented in the birth cohorts in this study, would have amounted to 65 million euros in 2002 alone.

CONCLUSIONS. The majority of adults who were born very preterm lived an independent and self-supportive life. Moderately preterm birth carries a considerable risk for long-term impairment. There are strong economic incentives for secondary prevention of disability associated with preterm birth.

Paper can be accessed at: http://pediatrics.aappublications.org/content/120/1/70.full.html

In the spirt of end of 2011 reviews of 'the best of', I have chosen the following paper as both the best review of, and the best evidence based article, that I have read in 2011:

Hickman R, McCoy SW, Long TM, Rauh MJ. Applying contemporary developmental and movement science theories and evidence to early intervention practice. *Infants & Young Child* 24 (1) 29-41, 2011.

The authors of this review article do an outstanding job of describing intervention strategies by dividing into first and second generation approaches based on differing theoretical constructs. The exciting information presented in this article is the integration of evidence and sound recommendations for developing the next generation of intervention practices.

Download the abstract here

If unable to access the full article, request assistance obtaining a copy of this article.

Phys Ther. 2011 Sep;91(9):1323-38. Epub 2011 Jun 30.

Pediatric physical therapy in infancy: from nightmare to dream? A two-arm randomized trial.

Blauw-Hospers CH, Dirks T, Hulshof LJ, Bos AF, Hadders-Algra M.

Source

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Abstract

Background Systematic reviews have suggested that early intervention by means of specific motor training programs and general developmental programs in which parents learn how to promote infant development may be the most promising ways to promote infant motor and cognitive development of infants with or at high risk for developmental motor disorders.

Objective The purpose of this study was to investigate the effects of a recently developed pediatric physical therapy intervention program ("Coping With and Caring for Infants With Special Needs" [COPCA]) on the development of infants at high risk for developmental disorders using a combined approach of a 2-arm randomized trial and process evaluation. Setting The study was conducted at the University Medical Center Groningen in the Netherlands. Participants and Intervention Forty-six infants at high risk for developmental disorders were randomly assigned to receive COPCA (a family-centered program) (n=21) or traditional infant physical therapy (TIP) (n=25) between 3 to 6 months corrected age (CA). Developmental outcome was assessed by blinded assessors at 3, 6, and 18 months CA with a neurological examination, the Alberta Infant

Motor Scales, the Pediatric Evaluation of Disability Inventory, and the Mental Developmental Index (MDI) of the Bayley Scales of Infant Development. Contents of the intervention were analyzed by a quantitative video analysis of therapy sessions. Quantified physical therapy actions were correlated to evaluate associations between intervention and developmental outcome components.

RESULTS: The trial revealed that developmental outcome in both groups was largely identical. Process evaluation showed that typical COPCA actions-(1) family involvement and educational actions, (2) application of a wide variation in challenging the infant to produce motor behavior by himself or herself and allowing the infant to continue this activity, and (3) stimulation of motor behavior at the limit of the infant's capabilities-had positive correlations with developmental outcome at 18 months CA. The use of handling techniques was negatively associated with the Pediatric Evaluation of Disability Inventory outcome at 18 months CA. Limitations: Major limitations were the limited size of the groups studied and the differences between the groups in frequency and duration of physical therapy sessions.

CONCLUSION: Extending the randomized trial with process evaluation was needed to obtain insight into associations between the components of intervention and developmental outcome. Specific therapist behaviors of parent coaching are associated with improved developmental outcome measures. Further studies are needed to examine whether these associations are caused by therapist behavior or whether therapist behavior is modified by children's motor skills.

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BMC Pediatrics Research article

Effectiveness of physical therapy interventions for children with cerebral palsy: A systematic review Heidi Anttila*1, Ilona Autti-Rämö1,2,3, Jutta Suoranta4, Marjukka Mäkelä1,5 and Antti Malmivaara1

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Abstract

Background: To assess the effectiveness of physical therapy (PT) interventions on functioning in children with cerebral palsy (CP).

Methods: A search was made in Medline, Cinahl, PEDro and the Cochrane library for the period1990 to February 2007. Only randomized controlled trials (RCTs) on PT interventions in

childrenwith diagnosed CP were included. Two reviewers independently assessed the methodologicalquality and extracted the data. The outcomes measured in the trials were classified using theInternational Classification of Functioning, Disability and Health (ICF).

Results: Twenty-two trials were identified. Eight intervention categories were distinguished. Four trials were of high methodological quality. Moderate evidence of effectiveness was established for two intervention categories: effectiveness of upper extremity treatments on attained goals and active supination, and of prehensile hand treatment and neurodevelopmental therapy (NDT) or NDT twice a week on developmental status, and of constraint-induced therapy on amount and quality of hand use. Moderate evidence of ineffectiveness was found of strength training on walking speed and stride length. Conflicting evidence was found for strength training on gross motor function. For the other intervention categories the evidence was limited due to low methodological quality and the statistically insignificant results of the studies.

Conclusion: Due to limitations in methodological quality and variations in population, interventions and outcomes, mostly limited evidence on the effectiveness of most PT interventions is available through RCTs. Moderate evidence was found for some effectiveness of upper extremity training. Well-designed trials are needed especially for focused PT interventions.

Hyperbaric treatment for children with autism: a multicenter, randomized, double-blind, controlled trial

Daniel A Rossignol, Lanier W Rossignol, Scott Smith, Cindy Schneider, Sally Logerquist, Anju Usman, Jim Neubrander, Eric M Madren, Gregg Hintz, Barry Grushkin and Elizabeth A Mumper. Accessed at http://www.biomedcentral.com/1471-2431/9/21

Abstract

Background: Several uncontrolled studies of hyperbaric treatment in children with autism have reported clinical improvements; however, this treatment has not been evaluated to date with a controlled study. We performed a multicenter, randomized, double-blind, controlled trial to assess the efficacy of hyperbaric treatment in children with autism.

Methods: 62 children with autism recruited from 6 centers, ages 2–7 years (mean 4.92 ± 1.21),were randomly assigned to 40 hourly treatments of either hyperbaric treatment at 1.3 atmosphere(atm) and 24% oxygen ("treatment group", n = 33) or slightly pressurized room air at 1.03 atm and 21% oxygen ("control group", n = 29). Outcome measures included Clinical Global Impression (CGI) scale, Aberrant Behavior Checklist (ABC), and Autism Treatment Evaluation Checklist (ATEC).

Results: After 40 sessions, mean physician CGI scores significantly improved in the treatment group compared to controls in overall functioning ($p = 0.0008$), receptive language ($p < 0.0001$), social interaction ($p = 0.0473$), and eye contact ($p = 0.0102$); 9/30 children (30%) in the treatment group were rated as "very much improved" or "much improved" compared to 2/26 (8%) of controls ($p = 0.0471$); 24/30 (80%) in the treatment group improved compared to 10/26 (38%) of controls ($p = 0.0024$). Mean parental CGI scores significantly improved in the treatment group compared to controls in overall functioning ($p = 0.0336$), receptive language ($p = 0.0168$), and eye contact ($p= 0.0322$). On the ABC, significant improvements were observed in

the treatment group in total score, irritability, stereotypy, hyperactivity, and speech ($p < 0.03$ for each), but not in the control group. In the treatment group compared to the control group, mean changes on the ABC total score and subscales were similar except a greater number of children improved in irritability ($p = 0.0311$). On the ATEC, sensory/cognitive awareness significantly improved ($p = 0.0367$) in the treatment group compared to the control group. Post-hoc analysis indicated that children over age5 and children with lower initial autism severity had the most robust improvements. Hyperbaric treatment was safe and well-tolerated.
Conclusion: Children with autism who received hyperbaric treatment at 1.3 atm and 24% oxygen for 40 hourly sessions had significant improvements in overall functioning, receptive language, social interaction, eye contact, and sensory/cognitive awareness compared to children who received slightly pressurized room air.
Trial Registration: clinicaltrials.gov NCT00335790

August-December, 2009

Effect of pediatric physical therapy on deformational plagiocephaly in children with positional preference: a randomized controlled trial.

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OBJECTIVE: To study the effect of pediatric physical therapy on positional preference and deformational plagiocephaly. DESIGN: Randomized controlled trial. SETTING: Bernhoven Hospital, Veghel, the Netherlands. PARTICIPANTS: Of 380 infants referred to the examiners at age 7 weeks, 68 (17.9%) met criteria for positional preference, and 65 (17.1%) were enrolled and followed up at ages 6 and 12 months. INTERVENTION: Infants with positional preference were randomly assigned to receive either physical therapy (n = 33) or usual care (n = 32). MAIN OUTCOME MEASURES: The primary outcome was severe deformational plagiocephaly assessed by plagiocephalometry. The secondary outcomes were positional preference, motor development, and cervical passive range of motion. RESULTS: Both groups were comparable at baseline. In the intervention group, the risk for severe deformational plagiocephaly was reduced by 46% at age 6 months (relative risk, 0.54; 95% confidence interval, 0.30-0.98) and 57% at age 12 months (0.43; 0.22-0.85). The numbers of infants with positional preference needed to treat were 3.85 and 3.13 at ages 6 and 12 months, respectively. No infant demonstrated positional preference at follow-up. Motor development was not significantly different between the intervention and usual care groups. Cervical passive range of motion was within the normal range at baseline and at follow-up. When infants were aged 6 months, parents in the intervention group demonstrated significantly more symmetry and less left orientation in nursing, positioning, and handling. CONCLUSION: A 4-month standardized pediatric physical therapy program to treat positional preference significantly reduced the prevalence of severe deformational plagiocephaly compared with usual care. CLINICAL TRIAL REGISTRATION: isrctn.org Identifier: ISRCTN84132771.

Jan.-August, 2009 Archives:

Preferred sleep position and gross motor achievement in early infancy Eli Carmeli & Rachel Marmur & Ayala Cohen & Emanuel Tirosh

Abstract: The aim of this study was to assess the effect of an infant's favoured position on their motor development at the age of six months. Seventy-five full-term infants were prospectively observed at home for their preferred sleep,awake, play and uninterrupted positions. A parental log was completed daily and then weekly up to the age of six months, when the Alberta Infant Motor Scale (AIMS) was administered. No significant relationship between the preferred or sleep positions as well as the awake and mutual play positions and gross motor developmental attainment at six months of age was noted. A significant change in the preferred recumbent posture with increased prone positioning both during sleep and awake time over the first six months was noted. A balanced positioning policy while awake, regardless of the infant's preference while recumbent, is not associated with gross motor delay.
Keywords Position . Gross motor development. Infancy

August-September, 2008 Archives:

Adolph KE, Vereijken B, Shrout PE. What changes in infant walking and why. *Child Dev*. 2003 Mar-Apr;74(2):475-97.

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This study compared the relative contributions of growing body dimensions, age,and walking experience in the development of walking skill in 9- to 17-month-old infants (N = 210), 5-6-year old kindergartners (N = 15), and college students (N = 13). Kinematic measures derived from participants' footprints showedcharacteristic improvements in walking skill. As children became bigger, older,and more experienced, their steps became longer, narrower, straighter, and more consistent. Improvements reflected a narrowing base of support and increasing control over the path of progression. Although both infants' age and the duration
of their walking experience contributed to improvements in walking skill,
experience was the stronger predictor. This finding suggests that practice is the more important developmental factor for helping infants to conquer their weak muscles and precarious balance.

July, 2008 Archive

Relationship-Focused Early Intervention With Children With Pervasive Developmental Disorders and Other Disabilities: A Comparative Study

MAHONEY, GERALD Ph.D.; PERALES, FRIDA M.Ed.

Journal of Developmental and Behavioral Pediatrics Volume 26(2), April 2005, pp 77-85

Abstract

ABSTRACT. This study compares the effects of relationship-focused early intervention on toddlers and preschool-age children who were classified as having either pervasive developmental disorders (PDDs) (N = 20) or developmental disabilities (DDs) (N = 30). The

intervention was conducted over a 1-year period through weekly individual parent-child sessions. It focused on helping parents use responsive teaching strategies to encourage their children to acquire and use pivotal developmental behaviors that addressed their individualized developmental needs. Before and after comparisons indicated significant increases in parents' responsiveness and children's pivotal behavior. Both groups of children made significant improvements in their cognitive, communication, and socioemotional functioning. However, children with PDDs made statistically greater improvements on the developmental measures than children with DDs. On several developmental measures, children's improvements were related to increases in both their parents' responsiveness and their own pivotal behavior.

June, 2008:. **Weindling AM, Cunningham CC, Glenn SM, Edwards RT, Reeves DJ.** Additional therapy for young children with spastic cerebral palsy: a randomised controlled trial. Health Technol Assess. 2007 May;11(16):iii-iv, ix-x, 1-71.

OBJECTIVES: To investigate whether, in the short and medium term, additional support by (a) a physiotherapy assistant improved physical function in young children with spastic cerebral palsy and (b) a family support worker improved family functioning. DESIGN: This was a multi-centre randomised controlled trial (RCT) with blinded assessments and a cost-effectiveness analysis. The children studied had spastic cerebral palsy that was the consequence of perinatal adversity. All were less than 4 years old on entry to the study. SETTING: In the child development centre and in the home. PARTICIPANTS: Seventy-six families completed the intervention period. Forty-three families were reassessed 6 months after the end of the intervention and 34 of these after a further 6-month period. INTERVENTIONS: Randomisation was to: (a) a group who received extra physiotherapy from a physiotherapy assistant; (b) a group who received standard physiotherapy; and (c) a group where the child received standard physiotherapy and the family was also visited by a family support worker. Children in all groups continued to receive standard physiotherapy in addition to the study interventions. MAIN OUTCOME MEASURES: The child outcome measures were motor functioning, developmental status and adaptive functioning. The family outcome measures were self-reported maternal stress, level of family needs and parental satisfaction. RESULTS: There was no evidence that additional physical therapy for 1 hour per week for 6 months by a physiotherapy assistant improved any child outcome measure in the short or medium term. Intervention by a family support worker did not have a clinically significant effect on parental stress or family needs. Over the 6-month period the total cost of services for each child ranged from 250 pounds to 6750 pounds, with higher costs associated with children with more severe impairments. No significant relationship was found between measures of intensity of services received by the children and families and the main outcome measures. Low-functioning children, in terms of both motor and cognitive function, were more likely to receive more services in terms of range and frequency. Parents generally reported high satisfaction ratings after all interventions and some stated that the interventions had benefited the child and/or the family. There was therefore a discrepancy between the perceptions of these parents and the objective, quantitative measurements. The family support workers identified a small number of families who were experiencing considerable family problems, but who had not been referred for appropriate support by any other agency. CONCLUSIONS: The findings of this study provide support for the current literature that there was no evidence that additional intervention (in this case by a physiotherapy assistant or family support worker) helped the motor or general development of young children with spastic cerebral palsy. Nor was there any quantitative evidence that providing extra family support helped levels of parental stress and family needs. The implication was that the provision of extra

physical therapy does not necessarily improve the motor function of a young child with cerebral palsy and additional family support should not automatically be assumed to be beneficial. In addition, no significant association was found between the intensity of the local services provided and any outcome measure, other than a slight association with lowered family needs. The provision of local services was related to the severity of the child's impairments and not to family difficulties. A small group of families with complex family problems needed more service input. There was a wide range in the costs of services. Research is needed to examine what 'sufficient' levels of provision or therapy might be for which children and which families. A time series of different levels of input and outcomes would provide valuable information for practitioners. It is also recommended that future assessments of therapies of this type adopt a similar multifaceted approach, which is likely to be more suitable than a simple RCT for the evaluation of clinical interventions where the effects are complex. The most appropriate measures of outcome should be used, including assessment of provision of information and emotional support for families.

May, 2008 Archives: **Lumeng JC**, **Somashekar D**, **Appugliese D**, **Kaciroti N**, **Corwyn RF**, **Bradley RH**. Shorter sleep duration is associated with increased risk for being overweight at ages 9 to 12 years. Pediatrics 120(5):1020-9, 2007.

Importance of the problem: Sleep appears to be an important regulator for energy balance, appetite (through hormonal regulation of leptin and ghrelin levels) and glucose tolerance. A lack of sleep has been established as a link to obesity in adults, but not in children.

In this study, 785 children were enrolled in the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development. Height and weight were measured in the third and sixth grades, and sleep duration and problems were based on maternal report. Overweight was defined as a body mass index (BMI) of 95th percentile or more for age and sex.

Results: Children slept on an average of 9 hours per night. Shorter sleep duration but not sleep problems in the both third grade (independent of weight) and sixth grade were independently associated with overweight in the sixth grade. For every additional 1 hour of sleep in the sixth grade, the child was 20% less likely to be overweight in the sixth grade (95% confidence interval [CI], 2% - 35%), and for every additional 1 hour of sleep in the third grade, the child was 40% less likely to be overweight in the sixth grade (95% CI, 1% - 64%).

Overweight children in the sixth grade were more likely to be boys; to be of minority race or ethnicity; and to have lower-quality home environments, more internalizing behaviors, and mothers with lower education.

Limitations of this study included use of a modified CSHQ, which can limit the ability to compare results with other studies; no objective measure of sleep problems; and no information about snoring or breathing difficulties that might suggest undiagnosed obstructive sleep apnea.

The study findings indicate that shorter sleep duration is associated with overweight risk in US elementary age children regardless of sex, race, or maternal education.

Clinical application: Information about sleep schedules should be an important component of a family interview when planning exercise prescriptions for elementary age children.