Physiotherapy Management of Children and Young People with Cerebral Palsy Mini Series

Session Three: Evidence based treatment for children and young people with unilateral Cerebral Palsy

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Study notes: Evidence based treatment for children and young people with unilateral Cerebral Palsy

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Aims:

1) To gain understanding of hemiplegia, hemiparesis and hemidystonia
2) To discuss the assessment and outcome measures of children and young people with unilateral Cerebral Palsy
3) To Discuss functional hand use and the importance of hand role differentiation
4) To develop knowledge and understanding of Constraint Induced Movement Therapy
5) To develop knowledge and understanding of Bimanual Therapy
6) To discuss current evidence of Botulinum Toxin-A
7) To discuss current evidence for lower limb rehabilitation

1) Unilateral Cerebral Palsy is when one side of the body is affected. When we describe unilateral Cerebral Palsy we describe the side of the body affected which is the opposite side of the brain that has had an injury. For example if I had a brain injury at the right side of my brain my left side of my body will be affected. Hemiplegia is when the child has paralysis throughout their affected side. Hemiparesis is when the child has muscle weakness throughout their affected side. Hemidystonia is when the child has involuntary throughout their affected side.

2) Subjective assessment.
   - History of pregnancy and birth
   - Any associated problems with their diagnosis
   - Developmental history and time frames of when achieving developmental milestones
   - Therapy input – current therapy and additional therapy
   - School age children – What input do they have at school. What is documented in the EHCP
   - Any equipment at home or school.
   - What hobbies and activities does the child enjoy.
   - When does the child need snack breaks / nap times
   - How does the child communication – Can any devices be used within therapy to decrease frustration

   Objective assessment:
   - Active & passive range of movement
   - Muscle power
   - Muscle tone
   - MSK deformities
   - Standing position
   - Gait
   - Motor planning
   - Co-ordination
   - Modified Ashworth Scale

- The Hand Assessment for Infants is used for 3-12 month old babies and infants. The Mini AHA is used for 8 – 18 months old infants. The AHA is used for 18 month – 12 years of age infants and children
- The hand assessment for infants purpose is to identify and measure goal directed hand use and possible upper limb asymmetry in infants at risk of developing cerebral palsy ages 3-12 months.
- The purpose of these assessments is to measure and describe how effectively children who have a unilateral disability use their affected hand in bimanual activity performance.

- The Paediatric motor activity log is a structured interview intended to examine how often and how well a child uses their affected arm within their natural environment with 2-8 year olds. The child's parent/guardian is asked questions about the amount of use of the child's affected arm and the quality of the child's movement during functional activities. The child's caregiver rates each question on a 0-5 rating for each scale and half scores can also be given such as 1.5 / 2.5.
- Both the How Often and How Well scales are completed pre-treatment. During treatment only the How Well scale is completed and this can be once a week. Both scales are then completed the day after the cast is removed, post treatment and future follow up testing.
- After administering the PMAL, mean PMAL scores are calculated for the two scales by adding the rating scores on each of the scales and dividing them by the number of items asked.
- The Cheq is the children's hand use experience questionnaire has been developed for children and adolescents with decreased function in one hand. The questionnaire asks questions that typically require the use of two hands. Parents can fill out the questionnaire by themselves or with the child.

3) Hand skills are vital for performance of activities of daily living and we know that the most efficient way to carry out ADL's is with two hands. Children with unilateral impairments may struggle with ADL and most importantly play. It is important that therapists can teach children how to use their affected upper limb in a manner that makes performance successful, effective and done with minimal effort. This will limit frustration and increase the child's play skills and also increase independence with ADL's. Our two hands have different roles for non-disabled and disabled people. We do not have a need for two dominant hands. This is more pronounced with a unilateral impairment and sometimes children/adults call their affected side their helper, assisting or supporting hand.

4) CIMT is a treatment technique used to increase functional use of the neurologically impaired upper limb through an intense therapy block whilst wearing a restraint at the unaffected upper limb. This treatment has been concluded as having strong evidence supporting its efficacy within at least 14 Randomised control trials many independent systematic reviews. CIMT is recommended intervention within the national clinical guideline for stroke and NICE guidelines for stroke rehabilitation. A CIMT programme should be made for each individual child. There any many factors to consider within the programme however we need to ensure that the programme includes a constraint of the unaffected UL, an intensive exercise programme for the affected upper limb and a programme to transfer the new gross and fine motor skills learnt during CIMT into bimanual play or everyday tasks.

5) "The process of learning bimanual skills through the repetitive use of carefully chosen, goal related, two-handed activities that provoke specific bimanual actions and behaviours". The child should be within supportive seating that provides enough support so they can focus on upper limb movements throughout the block. The tasks need to be specific to enable to the child to meet their bimanual therapy goals. Siting behind the child and using the same hands in front of them to demonstrate how to use the toy can be effective. Toy selection is key – wobbly and colourful toys are preferred within the bimanual block as many instructions will be used for hand placement such as left hand on blue brick and right hand on red brick.

6) Botulinum Toxin-A is a paralysing agent. Best results are when a therapy block is completed afterwards. The injection causes a temporary inhibition of the release of the neurotransmitter acetylcholine. Selected muscle groups are chosen between MDT to decide where the injections are required to reduce muscle activity (hypertonia). Muscle relaxation is normally present for 12-16 weeks afterwards.

7) When completing an assessment for children with unilateral CP you will carry out the same subjective and objective discussed earlier on in the presentation. The functional mobility scale is used to document how a child moves around their environment for 5, 50 and 500m used for 4-18 year olds children with CP. The paediatric berg balance scale can be used for children 3 years old and above. The measure tests 14 different items which test static and dynamic balance skills. The functional walking test can be used for children with CP 4-18 years old. This measure tests 11 items that are functional positions and transfers such as high kneeling and transferring into a standing position.