Risks of cognitive impairment and cerebral palsy
according to the cause of preterm delivery
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1. My name is Milla Ylijoki, and in this presentation I´m going to tell you about WP7 demonstration project on determining the effects of the cause of preterm delivery on the risk of suboptimal cognitive development and CP in preterm children

2. I will begin with a short introduction of myself and the PIPARI project.
   I work as a pediatric neurologist in Turku University Hospital in Finland, and I also teach medical students in Turku University.
   I have completed my PhD studies in PIPARI project in 2009 with a thesis called "Antenatal inflammation and brain patholy in preterm infants".
   In RECAP I am representing PIPARI project. PIPARI is a multidiciplinary project, where a 6-year cohort of VLBW/VPT infants born between 2001 to 2006 is followed till adulthood in Turku University Central Hospital. These children have been followed from perinatal period, and currently we are performing follow up at 17 years of age. Our multidiciplinary team has been evaluating physical, motor, cognitive, and neuropsychological development of these children, and the psychological well-being of these children and their parents has also been evaluated.

3. Preterm birth has many different causes. The leading causes of preterm birth can be divided into three groups, or preterm birth subtypes, which reflect these causes. These are: 1) spontaneous labour with intact membranes, 2) preterm premature rupture of the membranes (PPROM), and 3) labour induction or caesarean delivery for maternal or fetal indication.

   It is likely that the effects and pathophysiology of abnormal neurodevelopment are different according to the primary cause of preterm birth. Spontaneous preterm delivery and PPROM are often associated with intrauterine infection and inflammatory processes, which can also have an effect on the developing central nervous system of the immature infant.
   The most common reasons for indicating preterm birth are pre-eclampsia and intrauterine growth restriction, which can be caused by abnormal placental and fetal blood flow. This, on the other hand, is believed to affect the brain development and cognitive outcome of preterm born infants.
   Multiple pregnancies are also a major etiology behind preterm delivery. In multiples, preterm delivery can be caused by uterine overdistension, but also other pathologies can be present in multiples.

4. In reviewing the literature for our review, we have realized that there are not too many publications evaluating the effects of the cause of preterm delivery on the cognitive outcome and risk of CP in preterm children.
   Out of nearly 6000 hits from the original database search, we eventually found 14 publications which provide sufficient information to be used in the actual review.

There was a large variation between the preterm birth subtypes in these publications. While others have made the division only into two groups – spontaneous and iatrogenic delivery, others have up to six different groups, making the comparison rather difficult. Most of these publications use CP as an outcome, but especially the association between the preterm birth subtypes and cognitive development has not been studied much, as only four publications evaluated cognitive development.

5. The aim of our own study is to evaluate the effects of the cause of preterm delivery on the risk of suboptimal cognitive development, motor development and CP in preterm infants. Our hypothesis is that the different preterm birth subtypes have different consequences for the developing nervous system of a preterm infant .
To achieve our aim, we will divide the children according to the preterm birth subtypes into four groups. These groups will be spontaneous preterm delivery with intact membranes, PPROM, induced delivery or c-section before the beginning of contractions, and multiple pregnancies.
The outcomes we will use are cognitive development, motor development, and CP.
The patient population will be formed from the populations of the study groups participating in the RECAP project

6. We are currently in the phase where we are defining all the variables we are going to need to define the preterm birth subtypes. Also, we are planning how to harmonize the data from all the different cohorts. For these purposes, I have spent a lot of time going through the data available on the RECAP platform. In this slide I have screenshots from the excel files I have prepared while gathering the information. This is just to give you an idea about what we can actually find from the platform already, and how important the information is in planning our further projects and analyses.
Hopefully we will also have results from this project in the near future.

7. Here we have some useful references.

8. And here are some learning goals for this presentation.

9. Thank you!