Health condition and psychosomatic development of preschool multiple birth children

IZABELA MICHALUS, OLGA KURNATOWSKA, DANUTA CHLEBNA-SOKÓŁ

Abstract

Aim of the study was to answer the questions: What health problems are predominant in preschool multiple birth children? Do they have deficits within basic indicators of biological development? Do abnormal results of psychological tests occur in the children population studied. Among patients treated in the Prematurity Complications Out-patient Clinic, 44 children from multiple pregnancies were enrolled to the study. Results: Physical examination did not reveal significant abnormalities in the children’s health. Anthropometric measurements showed underweight in 11/42 (26.2 %) patients and low height in 10/42 (23.8 %) patients. Mean level of mental maturity defined as ability to classify, in the group studied was IQ = 103. As many as 31 children achieved normal Columbia score, four children above the normal range and six below. Conclusions: 1) Examinations performed revealed weight and height deficits in approx. 25% of the children, while health abnormalities (including chronic disease) were found only in small percentage. 2) Assessment performed revealed that only few children had mental maturity below the age-adjusted normal range, while majority of them achieved results within the range or above. 3) Our findings including lack of significant abnormalities found may be related with specialised, regular and complex medical care applied from first months of life. 4) Results of some psychological tests may suggest that parents and other family members were excessively thoughtful and caring.

Key words: twins, health condition, psychosomatic development

Introduction

Significant progress in intensive neonatal care has resulted in enhanced survival of premature newborns, including multiple birth infants. However, the rate of early and late complications in this group is still high, where process of growth and psychomotor development provide particular concern [1, 3, 8, 10].

The most common complication of multiple pregnancy, considered high-risk pregnancy, is premature delivery. Number of multiple pregnancies has increased within last several decades resulting in the increase in the number of premature newborns with low and very low birth mass [5, 8].

Multiples provide a group with particular risk of numerous complications, both early and late consequences of prematurity, including retinopathy (ROP), bronchopulmonary dysplasia (BPD), susceptibility to infections as well as deficits within indicators of biological development [8].

Aim of the study

Objective of our studies was to answer the following questions:

• What health problems are predominant in preschool multiple birth children?

• Do they have deficits within basic indicators of biological development?

• Do abnormal results of psychological tests occur in the children population studied, and in particular:
  - What is the level of their mental maturity and is there any association between mental maturity and perinatal parameters and environmental factors?
  - What is the locus of control in the preschool children population studied?
  - Which features of temperament are predominant and which ones differentiate children born as 1st and 2nd twin?

Material and methods

Among patients treated in the Prematurity Complications Out-patient Clinic and the Department of Foundations of Paediatrics and Metabolic Bone Diseases there are 292 multiple birth children (126 twin pairs, 12 triplet groups and 1 group of quadruplets). Figure 1 contains numbers of multiples supervised by the Clinic in particular age ranges.

Among the group of patients at preschool age, i.e. in 4th, 5th and 6th year of life, 44 children (19 twin pairs and 2 triplet groups) were enrolled to the study; how-
ever, one twin pair and one of triplets were not qualified for psychometric tests due to the lack of compliance.

Paediatric assessment included questionnaire survey (including perinatal data, child’s psychomotor development, treatment in specialised clinics, past diseases), analysis of somatic development on the basis of anthropometric measurements (weight and height) and thorough physical examination. Results of anthropometric measurements were compared against normal ranges, for given sex and age, for children of Lódź [7]. Values of somatic features lying between 10th and 90th percentile were considered regular. Moreover, significant medical problems and the necessity for treatment in other specialised clinics were recorded.

Psychological assessment included the following tests: Columbia Mental Maturity Scale (CMMS), Preschool Internal-External Control Scale, EAS Temperament Questionnaire and Socioeconomic Questionnaire. Columbia Mental Maturity Scale is a non-verbal test designed for the assessment of the child’s mental maturity level defined as “general reasoning ability”. The scale is designed for testing children aged 3, 6-9, 11 years [4]. During the test the child is to indicate an object on the board that doesn’t fit to other objects, while difficulty level gradually increases. Preschool Internal-External Control Scale comprises 18 questions describing various situations from the child’s life. There are two answers available for each question. Half of the questions provide Success scale, while another half Failure scale. The tool is designed for testing children aged 4, 6 to 7, 11 years [11]. EAS Temperament Questionnaire is designed for the diagnosis of temperament understood as the set of hereditary personality traits. Version designed for children refers to observational data collected from parents and comprises 20 items [9]. Socioeconomic Questionnaire comprises 18 questions concerning socioeconomic condition of parents and their place of residence, age, education, occupation and financial situation. The questionnaire was developed for the purpose of this study.

**Results**

Analysis of perinatal data revealed that all the children except one pair were born prematurely and their gestational age was within the range of 26-37 weeks (mean 34.5 weeks). Birth mass varied from 1220 to 2900 g (mean 2131 g). 12 pairs were born from 1st pregnancy, 3 from 2nd one and remaining from 3rd and higher ones.

According to the history, majority of children were under care of numerous specialised out-patient clinics, most (26/42 children) only under care of the Prematurity Complications Out-patient Clinic, additionally clinics of ophthalmology (11/42), rehabilitation (8/42), allergology (8/42) and others (Fig. 2). Several children were under care of more than one clinic.

Physical examination did not reveal significant abnormalities in the children’s health. The only exception was one patient with cerebral palsy involving lower limb dysfunction. 2/42 had history of Hirschsprung’s disease.
Among health problems detected, predominant were those typical for general preschool population, namely postural defects in 23/42 children and dental caries in 7/72 children (Fig. 3).

Assessment of anthropometric parameters within the study group revealed that their development is not consistent with age-adjusted normal range in general population. Underweight was found in 11/42 (26.2 %) patients and low height in 10/42 (23.8 %) patients; it should be noted that they were mostly children with deficit in both parameters (9 children). Numerical values and percentages of somatic factors (body mass and height/length) of the children studied in particular percentile ranges are given in Table 1. The children with somatic deficits included five children from triple pregnancies, one child with cerebral palsy, one twin pair with history of intrauterine hypotrophy and one premature infant born in 26th week of pregnancy. Somatic deficits were found in all the children from three twin pairs and one triplet group. All the children with somatic growth retardation were born prematurely with low or very low birth mass, except one twin pair born at term, but with intrauterine hypotrophy.

Table 1. Numerical values and percentages of somatic factors of the children studied in particular percentile ranges

<table>
<thead>
<tr>
<th>Studied parameter</th>
<th>Group of children (n = 42)</th>
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<tr>
<td></td>
<td>&lt; 10 c</td>
<td>10-90 c</td>
<td>&gt; 90 c</td>
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<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Body weight</td>
<td>11</td>
<td>26.2</td>
<td>31</td>
</tr>
<tr>
<td>Body length/height</td>
<td>10</td>
<td>23.8</td>
<td>32</td>
</tr>
</tbody>
</table>

Assessment with the Columbia scale involved 41 multiples; three children were excluded – two due to refusal to cooperate one due to inability to understand instructions. Mean level of mental maturity (IQ – intelligence quotient), defined as ability to classify, in the group studied was IQ = 103 (mean population valued is 100, and deviation 15). As many as 31 children achieved normal Columbia score, four children above the normal range and six below. Study subjects with Columbia score below the normal range included children born between 26th and 34th week of pregnancy, with low birth mass, Apgar score 5-7, mostly as 2nd twin, their parents had mostly only vocational education; they live in rural areas and mostly do not attend kindergarten.

Preschool Internal-External Control Scale was applied in 33 (80%) children, as 11 children did not perform the test due to the lack of compliance caused by fatigue or psychomotor agitation (the scale was the last study tool applied). No child achieved result indicating locus of internal control, and only 11 (33%) children featured locus of external control. The remaining group, that is as many as 22 (67%) children did not develop locus of external control yet.

Despite general result in Failure scale, all the children studied attributed their failures to external factors (chance, fate), while in Success scale a significant portion of them attributed their achievements to internal factors (consequence of their positive actions and behaviours).

Table 2. Results of psychological tests

<table>
<thead>
<tr>
<th>Methods</th>
<th>Numbers of children</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Below the normal range</td>
</tr>
<tr>
<td>COLUMBIA (Twin I&amp;II jointly)</td>
<td>6</td>
</tr>
<tr>
<td>SPK – DP (Twin I&amp;II jointly)</td>
<td>11</td>
</tr>
<tr>
<td>EAS</td>
<td>emotionality</td>
</tr>
<tr>
<td>Twin I</td>
<td>4</td>
</tr>
<tr>
<td>Twin II</td>
<td>9</td>
</tr>
</tbody>
</table>

EAS Temperament Questionnaire was applied to all the children studied, as it was completed by their parents. Activity is a dominant trait in twins born both as 1st and 2nd one. On the other hand, emotionality is a trait that most apparently differentiate 1st twin from the 2nd one. Twins born as second are more commonly considered by their parents more emotional.

Discussion

In spite of the fact that almost all the children studied were born prematurely, and frequently with low or very low birth mass, physical examination at preschool age did not reveal significant abnormalities in their health condition. Only one child was diagnosed with cerebral palsy. Lack of severe complications due to perinatal disorders may be explained by the fact that among the children studied only one was born with asphyxia, while average Apgar score for both 1st and 2nd twin was 7. Moreover, according to the history, all the children remained under ongoing care of Prematurity Complications Out-patient Clinic for first year or two years of life, and currently more than half of them take advantage of recommendations and care of the Clinic on regular
basis. Thus, early and professional diagnosis of abnormalities and their timely treatment may provide grounds for explanation of good health condition of the children studied.

On the other hand, assessment of somatic development of multiples revealed body mass and height deficits. According to literature data, children born prematurely feature catch up phenomenon, i.e. intensive dynamical development, allowing them to achieve, frequently in 2nd or 3rd year of life, somatic parameters matching their agemates born at term [2]. It should be noted that among the multiples studied as much as 25% of them did not “catch up” the developmental process, as too low mass and/or height was found in them, including 9 children with both parameters found too low. It should be associated mostly to low birth mass, prematurity and prematurity-related immaturity, but also with intrauterine hypotrophy and multiplicity of pregnancy, because as much as 5 children from the subgroup were triplets. Some contribution of environmental factors cannot be excluded, as such deficits were found in all the children from three twin pairs and one triplet group. Somatic retardation of prematurely born children was addressed in numerous publications [1, 2, 6, 10].

Literature information highlights poorer intellectual performance of premature children, in particular those born before 29th week, with very or extremely low birth mass, as assessed by IQ results, being lower by several points [3, 6]. We assessed mental maturity of these children by means of Columbia scale that is not general intelligence test, as it not measure verbal abilities; however, age range of the study subjects precluded the use of Wechsler Intelligence Scale. Mean Columbia score was IQ = 103 (mean population valued is 100, and deviation 15). However, the children group studied included only few premature children with extremely low birth mass which may contribute to favourable test results, as well as potential effect of general health condition and environmental factors [2-4].

Our findings including lack of significant abnormalities (including chronic disease) were found only in small percentage.

Conclusions

1) Examinations performed revealed weight and height deficits in approx. 25% of the children, while health abnormalities (including chronic disease) were found only in small percentage.

2) Assessment performed revealed that only few children had mental maturity below the age-adjusted normal range, while majority of them achieved results within the range or above.

3) Our findings including lack of significant abnormalities found may be related with specialised, regular and complex medical care applied from first months of life.

4) Results of some psychological tests may suggest that parents and other family members were excessively thoughtful and caring.

References


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