Temperament of premature infants with cerebral palsy

HYO JEONG RYU, MSc, PT1, KYOUNG DON KIM, MSc, PT1)*

1) Department of Physical Therapy, College of Rehabilitation Science, Daegu University: 201 Daegudae-ro, Gyeongsan-si, Gyeongsangbuk-do 712-714, Republic of Korea

Abstract. [Purpose] The purpose of this study was to examine the infant temperaments of children with cerebral palsy due to premature birth. [Subjects and Methods] Data were collected through questionnaires sent to 118 mothers of infants diagnosed with cerebral palsy due to premature birth. [Results] Different infant temperament scores were obtained according to the degrees of disability, type of palsy, birth weights, gestational age, and periods of hospitalization in an NICU; however, the differences were not statistically significant. [Conclusion] Additional comprehensive studies are necessary in order to understand the infant temperaments of newborns with cerebral palsy due to premature birth, as a prerequisite to providing efficient intervention programs supporting the children’s development and growth, and to verify statistical significance.

Key words: Cerebral palsy, Premature birth, Infant temperament

INTRODUCTION

According to the Korea Institute for Health and Social Affairs, the number of people registered with disabilities in Korea increases by approximately 5% each year, and brain lesion-related disabilities account for approximately 10% of all cases. Of the total number of disabled children in the 0–9 year-age range, 55% are children with cerebral palsy, which is higher than any other age group1).

This result is attributable to the fact that although the survival rate of high risk newborn infants, such as premature babies and low birth-weight infants due to premature birth, has increased thanks to the development of neonatal intensive care technologies, brain damage, which is the root cause of cerebral palsy, has not been prevented.

Infant temperaments are affective ties that humans experience for the first time immediately after birth, and they are one of the factors that affect mother-child relationships. To form strong mother-child relationships, it is necessary to understand infant temperaments and elicit appropriate interactions5).

Infants that are underdeveloped due to premature birth are in insufficient arousal states; thus, they have picky temperaments such as low mobility, decreased ability to concentrate, and a lack of patience. They are also hard to soothe and they avoid eye contact with others3, 4).

In the case of infants with cerebral palsy due to complications of premature birth, picky temperaments and physical and mental disabilities make it difficult for parents to nurture their children and this adds to their parenting stress5–7).

Therefore, this study aimed to examine the infant temperaments of newborns with cerebral palsy as perceived by the mothers who were taking care of them in order to better understand cerebral palsied infants, and to promote positive interactions between parents and children, thereby helping to improve effective adaptation.

SUBJECTS AND METHODS

The study subjects were 118 mothers of infants diagnosed with cerebral palsy due to premature birth among infants younger than 36 months who were receiving rehabilitation at three university hospitals, two children’s rehabilitation hospitals, and three private treatment centers located in Daegu. After first explaining the purpose of the study to the study subjects, and with the cooperation of the relevant institutions, the study subjects were asked to complete structured questionnaires, which took approximately 5–10 minutes. The protocol of this study was approved by Daegu University.

The questionnaires contained questions regarding the general characteristics of infants with cerebral palsy, questions about diverse premature birth-related variables such as gestational age, periods of hospitalization in the Neonatal Intensive Care Unit (NICU), type of cerebral palsy, and the degree of disabilities, and questions regarding the infants’ temperaments.

The Infant Characteristics Questionnaire (ICQ) developed by Bates3) was used to measure infant temperament. This questionnaire consists of a total of 24 questions which
aim to assess the infants’ temperamental difficulties using a seven-point scale, and higher scores indicate parents’ perceptions of higher levels of difficulties in dealing with the infants’ characteristics. That is, higher scores indicate that the parents feel that their child is harder to deal with in comparison to normal children, and that they feel that it is more difficult to nurture their child. Cronbach’s alpha reliability coefficient for the 0.87.

Sub-items under the factor analysis of the infant temperament scale include questions addressing: the ‘degrees of pickiness’, the degree of infants’ whining and the degree of difficulties in soothing; ‘maladjustment’, infants’ reactions and adaptation to new events, objects, or humans; ‘insensitivity’, infants’ activity and sociability; and ‘non-predictability’, infants’ physiological needs, such as hunger and wet diapers.

The collected data were analyzed using the SPSS 20 program for Windows. The test and ANOVA were conducted to examine infant temperament in relation to the respondents’ general characteristics, and correlation analyses were conducted to examine the correlations between different temperaments in cerebral palsied infants.

### RESULTS

Although no statistically significant differences were found, in the analysis of infant temperament in relation to infants’ general characteristics and premature birth-related variables, ICQ scores were higher when the degree of disability was greater, such as when a child with cerebral palsy also had quadriplegia, thereby indicating a picky temperament. Infants with a birth-weight below 1,000 g showed higher sub-scale scores indicating maladjustment and insensitivity. The infant temperament scores were higher in infants that had longer periods of hospitalization in the NICU. With regard to gestational age, infant temperament scores were higher in cases of premature birth before 28 weeks, although the differences were not statistically significant. The subscales of infant temperament showed positive correlations.

| Severity of disability | N  | Irritability | Non-adaptability | Dullness | Unpredictability |
|------------------------|----|--------------|-------------------|----------|-------------------|
| Mild                   | 53 | 3.3 ± 0.8    | 3.2 ± 0.9         | 3.0 ± 0.7| 3.5 ± 0.7         |
| Average severity       | 51 | 3.5 ± 0.7    | 3.3 ± 0.7         | 2.9 ± 0.7| 3.5 ± 0.7         |
| Very severe            | 14 | 3.8 ± 1.2    | 3.7 ± 0.9         | 2.9 ± 0.6| 3.9 ± 1.0         |

| Types of cerebral palsy|       |              |                   |          |                   |
|------------------------|-------|--------------|-------------------|----------|-------------------|
| Spastic quadriplegia   | 17    | 3.9 ± 1.0    | 3.7 ± 0.6         | 2.9 ± 0.8| 3.9 ± 0.8         |
| Spastic diplegia       | 55    | 3.4 ± 0.6    | 3.2 ± 0.9         | 3.0 ± 0.6| 3.4 ± 0.8         |
| Spastic hemiplegia     | 31    | 3.3 ± 0.9    | 3.3 ± 0.9         | 3.0 ± 0.7| 3.4 ± 0.7         |
| Other                  | 15    | 3.3 ± 0.8    | 3.4 ± 0.7         | 2.6 ± 0.6| 3.5 ± 0.7         |

| Birth weight (g)      |       |              |                   |          |                   |
|-----------------------|-------|--------------|-------------------|----------|-------------------|
| < 1,000               | 21    | 3.2 ± 0.8    | 3.5 ± 0.8         | 2.8 ± 0.8| 3.3 ± 0.8         |
| 1,000–1,500           | 29    | 3.3 ± 0.8    | 3.2 ± 0.9         | 3.0 ± 0.7| 3.5 ± 0.8         |
| 1,500–2,500           | 49    | 3.8 ± 0.8    | 3.3 ± 0.9         | 2.9 ± 0.6| 3.7 ± 0.7         |
| ≥ 2,500               | 19    | 3.1 ± 0.7    | 3.3 ± 0.7         | 2.9 ± 0.6| 3.3 ± 0.6         |

| Term of NICU (days)   |       |              |                   |          |                   |
|-----------------------|-------|--------------|-------------------|----------|-------------------|
| none                  | 15    | 3.1 ± 0.8    | 3.3 ± 0.7         | 2.8 ± 0.6| 3.5 ± 0.7         |
| ≤ 30                  | 46    | 3.5 ± 0.7    | 3.1 ± 0.9         | 2.9 ± 0.7| 3.5 ± 0.7         |
| ≤ 60                  | 27    | 3.7 ± 0.8    | 3.4 ± 0.7         | 2.9 ± 0.5| 3.7 ± 0.8         |
| ≤ 90                  | 30    | 3.4 ± 0.8    | 3.5 ± 0.8         | 3.0 ± 0.8| 3.5 ± 0.8         |

| Gestational age (weeks)|       |              |                   |          |                   |
|------------------------|-------|--------------|-------------------|----------|-------------------|
| < 28                   | 32    | 3.4 ± 0.9    | 3.3 ± 1.0         | 3.0 ± 0.8| 3.6 ± 0.8         |
| 28–34                  | 56    | 3.4 ± 0.7    | 3.3 ± 0.8         | 2.9 ± 0.6| 3.5 ± 0.7         |
| 34–37                  | 17    | 3.5 ± 0.9    | 3.0 ± 0.8         | 3.0 ± 0.7| 3.4 ± 0.8         |
| ≥ 37                   | 13    | 3.6 ± 0.8    | 3.6 ± 0.7         | 3.0 ± 0.6| 3.5 ± 0.8         |

Values are mean ± SD. NICU: neonatal intensive care unit

DISCUSSION

The purpose of this study was to examine children with cerebral palsy due to premature birth to evaluate the infants’ temperaments as perceived by their mothers, in order to help mothers caring for them better understand the characteristics of premature birth and cerebral palsy. This study also aimed to present the basic data necessary for the formation of healthy mother-child relationships and to identify therapeutic interventions for children born prematurely. Although no statistically significant differences were found the scores of some of the infant temperament sub-scales were higher in relation to the degrees of disability, type of disability, birth weight, period of hospitalization in the NICU, and gesta-
tional age (Table 1). Thus, our results indicate that infant temperaments perceived by mothers of premature children with cerebral palsy were not as good as infant temperaments perceived by mothers of normal children9). The results of studies that compared the infant temperaments of normal children with those of premature children, the results of studies that compared the infant temperaments of normal newborn babies with those of high risk newborn babies10), and the results of studies that compared normal weight birth infants with low birth weight infants show that higher risk infants and lower birth weight infants have pickier infant temperaments2). Other studies have shown significant correlations between infant temperaments and a mother’s parenting stress, confidence in infant care, depression, and self-worth11, 12).

This is considered to be attributable to the fact that a correct understanding of infant temperaments can lead to the formation of positive mother-child relationships and enhance a mother’s confidence and satisfaction in her role, thereby relieving her level of parenting stress.

A previous study reported that among the mother of high risk newborn infants, an experimental group that received education in integrated newborn infant intensive care units showed higher maternal self-esteem than a control group. Therefore, studies and programs should be developed to provide information regarding the infant temperaments of children with cerebral palsy due to premature birth13).

Since this study only investigated mothers who had children with cerebral palsy due to premature birth, additional studies are necessary in order to verify the statistical significance of this study’s findings by comparing children with cerebral palsy due to premature birth with normal children.

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