Quality of life in adolescents with primary headaches

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Abstract

Background: Headaches are common problems in adults, adolescents, and children. Headaches impact a child’s life, their family life, and even society. An assessment of quality of life in adolescents with primary headaches may help to determine actions necessary to improve the quality of life of these patients.

Objective: To assess the quality of life of adolescents with primary headaches compared to healthy adolescents.

Methods: We conducted a cross-sectional study in December 2009 on adolescents aged 13 to 18 years. The headache group consisted of children with primary headaches according to the International Classification of Headache Disorders and the control group consisted of healthy adolescents. Subjects were selected by consecutive sampling, with 75 subjects in each group. Subjects filled the Pediatric Quality of Life Inventory version 4.0 (PedsQL 4.0) questionnaire.

Results: The mean PedsQL total score was significantly lower in the headache group than in the control group (175.7 vs. 392.2, respectively, [95% CI of differences -28.1 to -219.3, P = 0.001]). However, out of 23 items in the questionnaire, 9 were not significantly different between the headache and control groups.

Conclusions: Primary headaches in adolescents is associated with lower quality of life. Most quality of life domains scores are significantly lower in adolescents with primary headaches compared to those without primary headaches.

Keywords: quality of life, primary headache, adolescents

Headache is the most common somatic complaint in children, and its prevalence depends on age and gender. Reported prevalences increase from 3% at age 3 to 7 years, to 4-11% at age 7 to 11 years, and 8-23% at age 11 to 15 years. Primary headaches arise intrinsically, without underlying disease. Examples of primary headaches are migraine, tension, and cluster headaches, with migraine as the most frequent type.

Headaches impact a child’s life, their family life, and even society. A Dutch study in adolescents aged 12-18 years with headaches reported that they experienced more stress, fatigue, and poorer moods than adolescents who did not experience headaches. An Ohio survey also found that children’s quality of life was adversely affected in all areas of functioning compared to the norms for healthy children.

An important outcome measure for treatment effectiveness is quality of life, which reflects the impact of disease and treatment using a subjective self-
evaluation with regards to child’s physical functioning and emotional well-being. Knowledge on the quality of life in children with headaches is lacking. To date, few studies in this field have provided information on a limited number of life domains, whereas measuring quality of life should be a standard part of evaluating treatment outcomes in pediatric headaches. Our study was designed to assess the quality of life of adolescents with primary headaches compared to healthy adolescents.

Methods

We conducted a cross-sectional study in December 2009 in three junior high and two senior high schools in the Secanggang Subdistrict, Langkat District of the North Sumatera Province. We included adolescents aged 13 to 18 years who suffered from primary headaches according to the International Classification of Headache Disorders (2nd ed.) and healthy adolescents without headaches as controls. Adolescents with systemic disease such as malignancy, sinusitis, other viral infections, and those with a history of trauma, or disorders of the central nervous system were excluded.

Subjects provided written informed consent and were divided into two groups: the headache group of adolescents with primary headaches and the control group of healthy adolescents. The minimum number of subjects required per group was calculated to be 73 using the formula samples for two independent populations. Subjects were selected by consecutive sampling.

All subjects filled the Pediatric Quality of Life Inventory (PedsQL) version 4.0 questionnaire, to assess their quality of life. We also measured the subjects’ weight and height. Before the questionnaires were filled, subjects were given instructions on how to fill the form and an explanation on the intent of the questions. We collected the filled questionnaires, examined them for completion, and calculated the sums and mean values for each domain, as well as the total values of all domains.

We used the PedsQL version 4.0 as an instrument to assess quality of life. This questionnaire covered four aspects of life: physical functioning (8 questions), emotional functioning (5 questions), social functioning (5 questions), and school functioning (5 questions), as shown in Table 1. Each question was scored on a scale of 0-4, depending on the difficulty in implementing the activity in question. Scores ranged from 0 (not having problems) to a score of 4 (always having problems). These scores were then translated into values of 100 to 0, with 0 = 100, 1 = 75, 2 = 50, 3 = 25 and 4 = 0. These values were added together and mean values calculated. Decreased quality of life was defined as a mean score lower than that of the other group. This study was approved by the Ethics Committee of the University of North Sumatera Medical School.

Results

Screening for primary headache was done in 463 adolescents. We included 75 adolescents with primary headaches according to the International Classification of Headache Disorders (2nd ed.) and healthy adolescents without headaches as controls. The minimum number of subjects required per group was calculated to be 73 using the formula samples for two independent populations. Subjects were selected by consecutive sampling.

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Results were considered to be statistically significant if P value was <0.05, with a 95% confidence interval. We used the independent t-test to assess for an association between primary headaches and quality of life in adolescents.

Table 1. Four domains of life assessed in PedsQL version 4.0

| Domains          | Problems                                                                 |
|------------------|--------------------------------------------------------------------------|
| Physical functioning | Walk > 100 m                |
|                  | Run                        |
|                  | Sport activity/exercise     |
|                  | Lift something heavy        |
|                  | Take a shower by self       |
|                  | Do chores around the house  |
|                  | Hurt or ache                |
|                  | Have low energy             |
| Emotional functioning | Feel afraid or scared      |
|                  | Feel sad or blue            |
|                  | Feel angry                  |
|                  | Have trouble sleeping       |
|                  | Worry about what will happen|
| Social functioning       | Have problem getting along with other kids |
|                  | Other kids don’t want to be friend |
|                  | Other kids tease me         |
|                  | Can not do things that other kids can do |
|                  | Hard to keep up when play with other kids   |
| School functioning     | Hard to pay attention in class |
|                  | Forget things               |
|                  | Have trouble with schoolwork|
|                  | Miss school because of not feeling well |
|                  | Miss school to go to the doctor |
headaches and 75 adolescents without headaches. We found no significant differences in sex, age, weight, and height between the groups. The 15-year-old age group had the largest number of subjects, as shown in Table 2.

Table 3 shows that mean PedsQL score was significantly lower in the headache group than in the control group in each of the four domains. In addition, the mean total scores were significantly lower in the headache group compared to the control group (175.7 vs. 392.2, respectively, P=0.001).

Among 23 problems assessed in the PedsQL, we found no significant differences between the headache and the control groups in the following nine problems: walk > 100m, lift something heavy, have low energy, have problem getting along with other kids, other kids do not want to be friend, can not do things that other kids can do, hard to keep up when play with other kids, hard to pay attention in class and have trouble with schoolwork. The scores of other 14 problems, all was significantly lower in adolescents with headaches compared to those without headache.

Discussion

Headache is one of the most common type of pain in children, besides abdominal and limb pain.14,15 Headaches in children and adolescents affect their quality of life11 and tend to continue into adulthood.16 Bothersome and long-lasting headaches have a negative influence on children.12 Children with headaches have a more pessimistic outlook and are less satisfied with their lives.12

The World Health Organization defines health-related quality of life as an individual’s perception of their position in life in the context of the culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns.17 In this study, we used the 4th edition of PedsQL as an instrument to assess quality of life in adolescents with headaches compared to healthy adolescents of similar age and educational background. Children’s quality of life may be assessed with various instruments, but the PedsQL is a commonly-used health-related quality of life measure in the pediatric literature.3

The 4th

Table 2. Subjects characteristics

| Characteristics                  | Primary headaches group (n=75) | Without primary headaches group (n=75) |
|----------------------------------|-------------------------------|----------------------------------------|
| Gender                           | Male (40.0)                   | Female (60.0)                          |
| Mean age (SD), years             | 14.8 (1.07)                   | 14.7 (1.02)                            |
| Age group by year, n (%)         |                               |                                        |
| 13 years                         | 9 (12.0)                      | 10 (13.3)                              |
| 14 years                         | 21 (28.0)                     | 22 (29.3)                              |
| 15 years                         | 23 (30.7)                     | 27 (36.0)                              |
| 16 years                         | 19 (25.3)                     | 14 (18.7)                              |
| 17 years                         | 3 (4.0)                       | 2 (2.7)                                |
| Mean weight (SD), kg             | 41.2 (7.22)                   | 36.8 (6.54)                            |
| Mean height (SD), cm             | 148.5 (7.92)                  | 145.8 (7.88)                           |
| Mean body mass index (SD)        | 18.6 (2.78)                   | 17.3 (2.52)                            |

Table 3. Mean scores of the PedsQL domains

| PedsQL domains | Primary headache group (n=75) mean (SD) | Without primary headache group (n=75) mean (SD) | 95%CI of differences | P value |
|----------------|----------------------------------------|-----------------------------------------------|----------------------|---------|
| Physical functioning | 252.3 (125.04) | 620.3 (141.04) | -409.7 to -326.1 | 0.001 |
| Emotional functioning | 162.0 (88.30) | 402.3 (84.05) | -267.1 to -213.8 | 0.001 |
| Social functioning | 197.5 (100.45) | 379.3 (105.10) | -214.2 to -150.2 | 0.001 |
| School functioning | 185.3 (96.00) | 399.5 (90.95) | -241.2 to -186.9 | 0.001 |
| Total               | 175.7 (88.20) | 392.2 (162.05) | -283.1 to -219.3 | 0.001 |

*Mean (SD)
We found a significant association between primary headache and quality of life. We also found a significantly lower mean total PedsQL score in adolescents with primary headaches than in healthy adolescents. A survey in Ohio on 572 patients with headaches found that children's quality of life was adversely affected in all areas of functioning when compared to norms in healthy children.11

Four domains were considered in the PedsQL: physical, emotional, social, and school functioning, with a total of 23 problems to be assessed. We found significantly lower scores in all four PedsQL domains in the headache group than in the control group. An Italian study reported that primary headache negatively influenced quality of life, with lower scores in psychological, physical and social functioning in the headache group than in headache-free controls.18

Our study had more female than male subjects. This gender difference may be explained by an experimental pain study in healthy human subjects which found that male subjects had greater stimulus thresholds and pain tolerance compared to female subjects.19

A limitation in our study was that we did not categorize primary headache by type, severity, and frequency of pain. Also, we only used quality of life data from the adolescents’ reports, without cross-checking with reports from parents or teachers. A previous study found that reports from multiple sources (parents, teachers, and children) provided more objective information.20

In conclusion, primary headaches significantly affect all quality of life domains in adolescents.

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