
The Prognosis and Treatment of Headaches in Children – a Ten Year Follow-up

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ABSTRACT: The prognosis and methods of treating headaches were studied in a group of children, 10 years after their initial diagnosis in 1983. Follow-up was achieved for 77 patients (81%). Headaches persisted in 72.7% but were much improved in 81.3%. Medication use was uncommon, with non-prescription medications used by 30.3% and prescription medications by only two. These data suggest that although childhood onset headaches are likely to persist, children who receive early education regarding the use of non-pharmaceutical methods of headache control appear to rely on these methods even after an interval of 10 years.

RÉSUMÉ: Le pronostic et le traitement des céphalées chez les enfants - suivi à dix ans. Nous avons étudié le pronostic et les méthodes de traitement des céphalées chez un groupe d'enfants, 10 ans après le diagnostic initial en 1983. Le suivi a été possible chez 77 patients (81%). Les céphalées persistaient chez 72.7% des patients, bien qu'elles aient été très améliorées chez 81.3%. L'utilisation d'une médication était rare, et il s'agissait d'une médication sans ordonnance chez 30.3% et d'une médication sous ordonnance chez 2%. Ces observations suggèrent que, bien qu'il soit probable que les céphalées qui débutent dans l'enfance persisteront à l'âge adulte, les enfants qui ont été entraînés à utiliser des méthodes non pharmacologiques de contrôle de la céphalée semblent recourir à ces méthodes, même 10 ans plus tard.

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Headaches occur in almost 70% of children,¹ with about 5% reporting migraine and 13 to 16% suffering from frequent non-migrainous headaches.² The prevalence of headaches in Canadian adults is 16.5% for migraine and 29.5% for tension-type headaches.³ It is unclear how headaches evolve in children and how those who present with pediatric headaches manage their symptoms as adults. The present study was designed to address the prognosis and methods of coping with headaches, 10 years after diagnosis, in a group of Canadian children who were initially diagnosed in 1983.

METHODS

All children who were seen by one of the authors (JD) during 1983 with a diagnosis of headache were entered into the study. Only patients who were seen in non-teaching clinics were included. These clinics were not attended by residents and were held during two afternoons each week. They were chosen because of the uniformity in diagnosis and treatment as all patients were assessed, coded and treated by one pediatric neurologist.

Patients were identified by reviewing the diagnoses of all patients seen in these clinics during 1983. The charts of all those with a diagnosis of headaches were reviewed.

All patients were traced through hospital and family physician records and were followed by a standardized telephone interview in 1993. Data were gathered regarding headache symptoms and other recurrent complaints.

In 1983 headaches were classified according to the criteria of Premsky.⁴ On follow-up in 1993 the IHS criteria were used to classify as migraine with or without aura and tension-type headaches.⁵ Those not meeting the criteria for these headache types were classified as "other" headaches.

When initially diagnosed all patients were advised to identify headache precipitants and were encouraged to use methods other than medication for coping with their headaches.

The type of headache, location, frequency, associated features, and both aggravating and precipitating factors were coded at diagnosis and in 1993. Headache severity was subjectively assessed by the patients depending on the degree of interference with daily activities. Information was gathered regarding neurological status at diagnosis. Patients were defined as normal, mild impairment, (e.g., strabismus), or major neurological deficit (e.g., cerebral palsy). Patients were asked about their preferred and most effective methods of headache control, associated symptoms (motion sickness, somnambulism or distortions of perception), other recurrent health problems and recent visits to physicians.

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Data were analyzed using a computer software package (EPI-Info 5.1).

RESULTS

Seventy-seven of 95 patients (81%) who were initially seen because of headaches in 1983 were contacted by telephone in 1993. Eighteen patients were lost to follow-up. There were 49 boys (63.6%) and 28 girls (36.4%). The age at diagnosis ranged from 3.3 to 16.2 years (mean=10 years, SD=3 years).

At diagnosis 25 (32.5%) had a family history of headaches. Sixty-five (84.4%) were neurologically normal, 6 (7.8%) were mildly impaired and 6 (7.8%) had significant neurological impairment, including CP.

When first seen, 18 (23.4%) had tension-type headaches, 49 (63.6%) had common migraine (without aura), 5 (6.5%) had classical migraine (with aura) and 5 (6.5%) had headaches of other types. Of these, one had post lumbar puncture headache, one had a medulloblastoma, one had agammaglobulinemia with CNS lesions on CT scan and subsequently on MRI. The final two children had "other" headaches which were benign.

At 10 year follow-up 21 (27.3%) were headache free, 22 (28.6%) had tension-type headaches, 26 (33.8%) had migraine without aura and 7 (9.1%) had migraine with aura. One patient had died from complications of congenital heart disease which were unrelated to his headaches. Two patients had 2 types of headache, both had tension-type headaches and one had migraine with aura and the other had migraine without aura.

When divided by headache type, those with tension-type headaches were more likely to be headache-free on follow-up (Table 1). The headache type at initial diagnosis did not predict the type of headache present at follow-up. Of those with tension-type headaches in 1983, 11% had migraine in 1993, while 22.4% of those who complained of migraine without aura and 60% of those who had migraine with aura had tension-type headaches on follow-up ($p = .016$, X^2) (Table 1).

There were 5 patients with "other" headaches and of these 2 were headache free, 1 had tension-type headaches, 1 had migraine with aura and the remaining patient with agammaglobulinemia continued to have numerous neurological problems.

The severity of headaches, as assessed by the patients, was moderate to severe for 76.7% at diagnosis and 46% after 10 years. Initial headache severity was unrelated to the severity at follow-up ($kappa = 0.03$). Mild headaches were initially reported by 23.3% and subsequently by 27.6%, while 27.3% had no headaches after 10 years. At diagnosis the mean headache frequency was 11.03 per month (SD 11.7) compared to 2.07 per month at 10 years (SD 4.6).

When contacted in 1993, 61 (80.3%) felt their headaches were better, 78% of those with tension-type headaches, 80%

with migraine with aura and 82% of those with migraine without aura ($p = .66$, X^2). Headaches were reported to be better by 84% of males and 71% of females ($p = .23$, X^2). Only 10 (13.2%) reported that their headaches were unchanged and 5 (6.5%) felt they were worse.

At follow-up, 25 (32.9%) reported that they required no treatment for their headaches, 13 (17.1%) primarily used a period of sleep to treat their headaches, 8 (10.5%) used some form of relaxation and 4 (5.3%) avoided precipitants (Table 2). It is of interest that only five patients found food to be a significant headache precipitant. Non-prescription medication was used as the primary method of controlling headaches by 23 (30.3%), (25% of boys and 42.3% of girls), although none used them often enough to experience rebound headaches. Of the 56 patients with headaches at follow-up 41% were using nonprescription medications. Two girls (2.6%), one with migraine with aura and one with migraine without aura, usually used prescription medication at the onset of their headaches. The remaining patient, with agammaglobulinemia, was on multiple medications. During the month prior to the follow-up telephone interview only two (2.6%) had seen a physician because of headaches.

Associated symptoms were common in both patients with migraine and tension-type headaches. Twenty (26.3%) had a history of motion sickness and 11 (14.5%) had somnambulism. Sensory disturbances were reported by 8 (10.5%) for the "Alice in Wonderland" phenomenon and by 13 (17.1%) for "The Rushes".⁶

DISCUSSION

The prognosis for children with headaches is unclear. Some reports have suggested an excellent outcome, with 60-80% reporting improvement on follow-up.^{2,7,8}

Burke and Peter reported the responses to a questionnaire from 58 of 89 children, followed at the Mayo Clinic for 1 to 2 years and found that although the 47 of 58 (83%) still had migraine, over half were improved from the time of initial diagnosis.⁹ Hinrichs and Keith looked at the same group of children 9 to 14 years after diagnosis and found that 33% were completely well, 47% were improved and 20% were either unchanged or worse.⁷ Others have been less optimistic. Bille followed 73 patients with more pronounced migraine after 23 years.¹⁰ Of the 62% who were headache free for at least 2 years, one-third subsequently relapsed. Of those 30 years of age or older, 60% still suffered from migraine. Similarly Silanpaa found that the prognosis for migraine was less optimistic.¹ In his epidemiological study of 2921 Finnish children, he reported that after 7 years only 22% were symptom free, 37% were improved but 41% had unimproved or more severe headaches.¹ Our patients did well and although 72.7% still had headaches only 19.7% felt their

Table 1.

Headaches in 1993	Headaches in 1983			
	Tension	Migraine Without Aura	Migraine With Aura	Other Headaches
Headache Free	9 (50%)	10 (20.4%)	0 (0%)	2 (60%)
Tension-type	7 (39%)	11 (22.4%)	3 (60%)	1 (20%)
Migraine Without Aura	2 (11%)	23 (46.9%)	1 (20%)	0 (20%)
Migraine With Aura	0 (0%)	5 (10.2%)	1 (20%)	1 (20%)

Table 2. Primary Method of Treating Headaches at Follow-up.

No Treatment	25 (32.9%)
Sleep	13 (17.1%)
Relaxation	8 (10.5%)
Precipitant avoidance	4 (5.3%)
Nonprescription medication	23 (30.3%)
Prescription medication	2 (2.6%)

headaches were unchanged or worse. There was no correlation between the severity of headache at diagnosis and at follow-up.

The prognosis appears to be affected by the headache type at initial diagnosis. Of our patients with tension-type headaches 50% were headache free after 10 years while only 18.5% of those with migraine were symptom free. Similarly Bille reported that 70% of children with tension headaches and 33% of those with migraine were symptom free at six year follow-up.² In our population some patients who initially complained of tension-type headaches subsequently had migraine and vice-versa. Our study addressed a preselected group of children who attended a pediatric neurology clinic and therefore may have had headaches which were more severe than average. Linet et al. reported a telephone interview with 10,169 residents of Washington County, Maryland, who were between 12 and 29 years old.¹¹ Migraine was reported by 7.4% of females and 3% of males. Although 90.8% of males and 95.3% of females had a history of one or more headaches, only 15% of men and 28% of women had consulted a physician because of headaches.¹¹ Similarly only two of our patients had seen a physician during the month prior to telephone contact in 1993.

Associated features are more common in childhood and tend to resolve in adolescence. Motion sickness was most frequent. The "rushes", which consist of a perception that objects are moving faster than normal,⁶ was more frequently reported than both somnambulism and the "Alice in Wonderland" phenomenon, where alterations in perceived size are reported.

When seen in 1983, at initial diagnosis, our patients were encouraged to identify headache precipitants by using a headache diary. They were also advised to use non-pharmacological methods of coping with their headaches, such as rest and relaxation. No patient was prescribed medication at diagnosis. At follow-up this approach to headache control persisted. Only 30.3% of our patients used medication to control headaches. This is in comparison to 87% of patients who used nonprescription medications in the recent population based survey of Canadians with headaches.

Only two of our patients used prescription medications compared to 44% of adult migraine patients and 24% of those with tension-type headaches in the Canadian Population Survey.¹² This suggests that headache patients who are advised regarding non-pharmacological approaches to headache management in childhood appear to continue to rely on these methods after an interval of 10 years.

In conclusion we contacted 81% of 98 children, 10 years after headache diagnosis. Headaches persisted in 72.7% but were much improved in 81.3%. Medication use was uncommon, with non-prescription medications used by 30.3% and prescription medications by only two.

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