

ORIGINAL ARTICLE

RECURRENT LIMB PAIN IN SCHOOL CHILDREN

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Abstract

The objective of the study was to determine the prevalence, clinical features and factors that influenced recurrent limb pain in school children. A population based study was carried out in two stages with an initial screening questionnaire followed by clinical interview of symptomatic children. The setting was two secondary schools (one boys and another girls) in Khulna, a divisional city of Bangladesh. The subjects were 1200 school children, representing a sample of 20% of all school children with age ranging between 7 and 15 years. The main outcome measures were prevalence of recurrent limb pain, nature of pain, influencing factors and relation with other painful conditions. The results showed the prevalence rate of recurrent limb pain was 13.4%, with male:female ratio of 1:1.4. The nature of pain was mostly dull aching (54%), and 64% had full activity. Lower limb was predominantly (77%) affected involving both muscles and joints (46%). Majority (44%) of children were above average performers and 54% came from dysharmonious families. Tiredness (63%) was the most important triggering factor and rest (65%) was the major relieving factor. Twenty nine percent of the children had other associated painful conditions. In conclusion recurrent limb pain is a common painful condition in children. The diagnosis is completely clinical and based on exclusion of organic diseases.

Key words: *Recurrent limb pain; school children*

Introduction

Recurrent limb pain (RLP) is a common problem in school children. The predominant causes of

chronic limb pain in children are accidental injuries, reactive arthritis, invasive infections, joint disorders and malignancy.¹ In a large number of children the cause remains unknown, and it has been termed as growing pain by both layman and medical professionals.² Such pain is non-articular, involving mainly thigh and calf muscles and occurring mostly at night.³ Episodes of pain usually last for a few hours with complete remission in between attacks. Occasionally it is accompanied by a sensation of restlessness but never by tenderness, redness or local swelling. It has also been reported as psychosomatic musculoskeletal pain which may occur in association with headache and abdominal pain.^{4,5} The reported prevalence rate of RLP in children have ranged between 2.6% and 19.8%.^{6,7} Such a wide range reflects the diversity of methods and diagnostic criteria used in different studies. However epidemiological data suggest that boys and girls are almost equally affected.² This non-rheumatic benign condition has little resemblance to rheumatic diseases, especially rheumatic fever and juvenile rheumatoid arthritis.^{8,9} Even though clinical findings are sufficient to distinguish them, a multitude of investigations are carried out to exclude organic diseases. Physicians caring for such children need to be aware of these factors in order to limit their investigations and treatment. To our knowledge, no such report is available for Asian children. Therefore we carried out this study to focus on the epidemiology, clinical features and contributory factors for RLP in our school children.

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Materials and methods

Population: RLP was studied as part of a wider study of recurrent painful conditions in school children of Khulna, a divisional city of Bangladesh. The two largest school in Khulna are Coronation Girls High School and Khulna Zilla (boys) School which accommodate approximately 3000 students each in double shift with the age ranging between 7 and 15 years. Twenty percent of the population was considered as a representative number and systematic random sampling was carried out. Permission was obtained from the heads of both institutes to carry out the study between July 1998 and June 1999.

Design: This study was carried out in two steps. Initially a questionnaire with a forwarding letter was given to the selected students who were asked to complete the questionnaire with the assistance of their parents. The questionnaire recorded general information such as age, sex, class position, family members and specific information relating to RLP in the past year:— i) more than one attack ii) less than 72 hours duration and iii) no specific cause. Children who did not return the questionnaire within two weeks were sent a reminder through their class teachers. In the second step parents of symptomatic children (meeting all the three conditions) were invited for clinical interview. A detailed history was obtained and physical examination was performed. Those who were unable to attend were interviewed over the telephone.

Diagnosis of RLP was based on the following criteria adopted from the study of Arafah and Russel:⁶

Criteria for diagnosis of RLP

1. At least two episodes of limb pain over one year.
2. Pain is not due to trauma, infection or specific illness.
3. Absence of swelling, tenderness, limitation of movement and hyperextensibility.

4. Each episode lasting not more than 72 hours.
5. Complete resolution of symptom between episodes.

School performance was determined based on the results of school-examination. Classification of family environment was based on the relation between parents and care of their children.

Analysis: Data from questionnaires and interviews were collected on a coded checklist and statistical analyses were done on the basis of mean, standard deviation, proportion and confidence interval.

Results

The questionnaire was given to 1200 selected children, 600 each from the two different schools. The completed questionnaires were returned by 718 children initially and 134 responded after a reminder with a total return of 852 (71%). Of these, 462 were boys and 390 were girls.

There were 187 children with a possible diagnosis of RLP, all of whom were asked to attend a clinical interview. Only 85 attended physically and 61 were interviewed over the telephone. The remaining 41 (22%) did not respond. At the end of interview 89 children met the criteria of RLP. There were 41 boys and 48 girls. The estimated prevalence rate was calculated by adjusting for the children who had RLP but failed to attend for interview. Thus actual prevalence (89) multiplied by a factor 1.28 (187/146) yielded an estimated prevalence of 114. The prevalence rate was thus 13.4% (95% confidence interval 11.1 – 15.1). After a similar correction, keeping the ratio intact for male and female children the prevalence figure stood at 11.5% for boys and 15.6% for girls (Table I). The mean age of school children with RLP was 9.6 years. Symptoms have started from the age of 3 years and the mean age of onset was 6.5 years. The average number of painful episodes were 15 times per year, each episode lasting about 6 hours. Seventy two percent children

suffered regularly, especially in the evening. Table II indicates the quality and severity of pain. Fifty four percent children described the pain as sore or dull aching and loss of activity was noticed in 9% children. Seventy seven percent children felt pain in the lower limbs and 46% complained of involvement of both muscles and joints (Table III).

The influence of school performance and family harmony is shown in Table IV. Twenty one percent children were of average intelligence and in 54% of cases family conflict was present. Tiredness aggravated the problems in 63% children and rest improved the situation in 65% cases (Table V). In 29% of the children RLP was associated with headache and/or abdominal pain (Table VI). RLP resulted in absentism (5 schools days/year), and similar problem was noticed in first degree relatives in 22% of cases.

Discussion

Recurrent limb pain in childhood is a well defined symptom-complex but research into the aetiology and pathogenesis has been scanty.^{3,10} Until these factors are elucidated, the terminology remains obscure. In the school going children accidental injuries are the most frequent cause of painful limb.^{6,11} Apart from specific illness the large bulk of them suffer from an unknown cause which is consistent with benign form of recurrent limb pain. Up till now, the condition has received little attention in Asia. Therefore the criteria for diagnosis have been derived from European studies which again is not uniform.^{6,12} In this study of random selection of 20% school children, 71% respondents for the questionnaire and 78% for the interview are acceptable for a developing country. One year recall has its limitation but recall was made here both by parents and children.

Table I. Demographic features of children with recurrent limb pain

Prevalence	Total	: 114/852 = 13.4%
		(95% CI 11.1 – 15.1)
	Male	: 53/462 = 11.5%
	Female	: 61/390 = 15.6%
Mean age of sufferer	: 9.6 years (SD \pm 1.2)	
Mean age of onset	: 6.5 years (SD \pm 3.7)	
Mean episodes/year	: 15 (SD \pm 13, range 2–54)	
Mean duration/episode	: 6 hours (SD \pm 14, range 1–60 hours)	
Time of pain	: Evening 72%, anytime 28%	

Table II. Quality and severity of pain in children with recurrent limb pain

		Number	Percentage
Quality:	Cramps	28	31
	Sore	48	54
	Stabbing	13	15
Severity:	No activity	8	9
	Some activity	24	27
	All activity	57	64

Table III. Involved limbs and location of pain in children with recurrent limb pain

		Number	Percentage
Limbs:	Lower limb	69	77
	Upper limb	5	6
	Both	15	17
Location:	Joints	29	33
	Muscles	19	21
	Both	41	46

Table IV. Personal and family factors of children with recurrent limb pain

		Number	Percentage
School performance:	Good	39	44
	Average	19	21
	Poor	31	35
Family harmony:	Harmonious	19	21
	Border line	22	25
	Conflicting	48	54

The prevalence of RLP in our study is 13.4% with a male to female ratio of 1:1.4. The prevalence of RLP in western countries varies widely, such as 4.2% in England,² 13.6% in Sweden,⁷ 4.5% in Australia,¹³ 15.5% in Denmark³ and 2.6% in Scotland.⁶ This wide variation is attributed to different diagnostic criteria and age group of selected children. In all the cases studied there is female preponderance which is consistent with the present study.⁴ Although the mean age of "suffering" school children was 9.6 years, the problem started much earlier at the preschool age of 3 years. Arafah and Russel observed 12 episodes of pain in a year which lasted for 10 hours.⁶ In this study, the episodes were more frequent (15) but duration was less (6 hours). Sixty percent of Aberdeen children had no definite time for pain.⁶ We found 72% children experienced pain in the evening, which is similar

to the finding by Oster and Nielsen.³

The quality of pain was just sore or dull aching in Scottish children but it was severe enough to limit physical activities. In the present investigation, the quality of pain was similar but was of a mild nature which did not interfere with normal activities in most (64%) of the cases. Apley and others found growing pain predominantly localised to the lower limbs and were non-articular.^{14,15} This is in agreement with our study except for articular involvement. Although calf muscles were the commonest site, the knee joint was also involved in a large number of children as was found by other investigators.⁶

The different influencing factors for RLP highlighted by other authors included intelligence, school performance, personality and family background.^{5,16} We found children of average performance were less (21%) likely

to suffer from RLP and the majority (54%) of affected children belonged to disturbed families. Sherry et al described RLP as psychosomatic musculoskeletal pain. The surrounding psychodynamics of these children are complex and when stress mounts they tended focus attention on themselves and are withdrawn from competition.⁵ RLP was found to be aggravated by tiredness (63%) and relieved by rest (65%) alone which agree with the views of other workers in this field.^{2,6} However massage of the affected part was also helpful during rest in our cases.

Twenty nine percent children with RLP had associated painful conditions which is in sharp contrast to the higher figures (53%) in Aberdeen. From studies of migraine and abdominal pain it was observed that nonspecific limb pain was common in these children. Such a relationship suggests that painful conditions may have some common pathogenesis.^{5,17} In 22% of cases a similar problem exists in first degree relatives which supports a hereditary background.⁴ School failure from RLP was due to worry as happened in other painful conditions.¹⁷

In conclusion RLP is a common disturbing problem in children from South Asia. Prior to labelling the diagnosis as RLP, organic disease, autonomic dysfunction and joint hypermobility should be excluded.^{18,19} Children with idiopathic recurrent limb pains require special attention because reassurance and emotional support are the mainstay of treatment for this common problem.

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