Demographic and Clinical Characteristics of Children with Growing Pains

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Abstract

Background: *Growing pains is the most common benign unexplained limb pain in childhood that tends to self-limit once the child reaches adolescence. The present study aimed to get the details knowledge and compare different demographic and clinical characteristics of growing pains (GP).*

Methods: *This cross-sectional study was conducted from August 2021 to September 2022 at National Centre for Control of Rheumatic Fever and Heart Diseases, Dhaka, Bangladesh. Children of 3-12 years irrespective of sex with unexplained limb pain suspected of growing pains were included in the study. Suspicion of growing pains was based on inclusion criteria and exclusion criteria from the definition of Peterson. By collaboration of clinical history, detailed physical examination, result of relevant laboratory and radiological tests confirmatory diagnosis was made.*

Findings: *Among 220 children with unexplained limb pain 73.2% were diagnosed clinically as growing pains. Boys were predominant (52.2%) among children with GP; 60.9% of them were between 5 to 8 years and the mean age was 7.05±2.32 years. The pain was mostly bilateral and calf muscles were the most common sites. Pain was more frequent at night and half of the children complained about pain occurring several times a week. Massaging was the most effective measure followed by oral anti-inflammatory analgesics for pain relieving. The pain was associated with daytime over-activity and a history of GP among siblings.*

Conclusion: *Growing pains was diagnosed among three-fourths of children with unexplained limb pain. Daytime over-activity, obesity, and a positive family history may be the potential risk factors. Demographic and clinical characteristics of growing pains in the Bangladeshi paediatric population were typical as reported in other studies.*

Key words*: Growing pains, children, unexplained limb pain.*

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Introduction

Growing pains (GP), the most common form of nonspecific, recurrent leg pain syndrome of early childhood, was first described by French physician Marcel Duchamp in medical literature in 1823.[1] Growing pains is one of the most frequent causes of paediatric outpatient visits. It is considered to be a normal occurrence in about 25% to 40% of children with no organic pathology.[2,3] Worldwide the prevalence of growing pains is reported with a wide range estimating from 2.6 to 49.4%.[4] A recent study

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established the prevalence of growing pains in children aged four to six years as 37%.[3] A study done in Bangladesh shows that the prevalence of growing pains is 19% among school-going children, whereas, among patients of unexplained limb pain, 75% were diagnosed as GP here.[5,6] This variation and discrepancy between the prevalence is mainly due to different and unspecified sample sizes, geographical areas, age ranges, and different types of objective diagnostic criteria adopted in different studies.[5]

Growing pains is confined to childhood; it is usually self-limiting and almost always benign in nature.[7] It does not progress to organic disease and usually resolves by adolescence.[4] GP mainly affects children aged 4-12 years and is most prevalent in those aged 4-6 years.[8] It is typically non-articular, intermittent, bilateral and not associated with limited mobility. It is located in the muscles and predominantly affects the anterior thighs, calves, shins or backs of knees.[9] Pain can be precipitated by exercise and lasts from minutes to hours. GP more often happens at night or evening, but almost always it resolves by morning. The hallmark of growing pains is that it always affects both legs and is gone in the morning.[10] It may sometimes be so severe that can make the kid cry and parents of children may often complain about the association of episodes of growing pains with periods of increased physical activity.[9,10] Frequent painful episodes usually have an important impact on the daily activities of the children and their families.[2]

Correct diagnosis of growing pains requires a careful history and thorough physical examination. Currently, the diagnosis is based only on typical clinical symptoms and exclusion criteria. Its diagnosis remains mainly clinical, based on the criteria described by Peterson; comprising bilateral, non-articular, intermittent pain in lower limbs, characteristically occurring in the evening.[12,13] Treatment is provided through muscle stretching as well as massaging the affected sites or using analgesics.[14,15] Management also focuses on reassurance, education, and healthy sleep hygiene.[16]

In Bangladesh, growing pains is quite common among paediatric population. Being a specialized center for rheumatic fever National Centre for Control of Rheumatic Fever and Heart Diseases (NCCRF&HD) deals with many patients with nonspecific unexplained limb pain. Saha et al reported that 75% of the patient with nonspecific pain in this center was diagnosed clinically as growing pains.[17] Therefore, the present study was conducted to get the details about the demographic and clinical characteristics of growing pains among children of Bangladesh. So that it will increase awareness among the parents and also help the physicians to better manage this kind of patient.

Materials and Methods

This cross-sectional study was conducted at National Centre for Control of Rheumatic Fever & Heart Diseases, Dhaka from August 2021 to September 2022. During this study period, children of 3-12 years irrespective of sex with unexplained limb pain suspected of growing pains attending the outpatient departments of NCCRF&HD were enrolled in the study.

Suspicion of growing pains was based on the inclusion criteria and exclusion criteria according to the definition of growing pains and modified after Peterson.[12,13] Inclusion criteria were children having intermittent, non-articular pain in limbs that generally occurred late in the day or at night. Exclusion criteria were (1) children having persistent pain, unilateral, increasingly intense pain at night that will still present the following morning and joint pain, (2) children having organic causes of pain or signs of inflammation such as local tenderness or swelling, (3) underlying illnesses such as rickets, malnutrition, rheumatologic disorders, celiac disease or other systemic illness. Purposive sampling was used as per inclusions and exclusion criteria.

Paediatric patients with non-specific musculoskeletal pain in limbs suspected of growing pains were enrolled in this study. Specialist physicians attended the patients; clinical history was taken; detailed and

thorough physical examination of the different systems was done and necessary laboratory investigations and radiological tests were done to diagnose growing pains. By collaboration of clinical history, physical examination, and result of the laboratory tests a confirmatory diagnosis was made.

Venous blood sample was collected for laboratory investigations. Complete blood count (CBC) was done in automated cell counter machine (ERBA Lyse, Germany) and ESR was performed in an automated ESR machine (VES mtric 20). Biochemical tests were done in an automated analyzer machine (ERBA Automated XL 200).

Pain severity was evaluated using Visual analog scale (VAS) which is a pain rating linear scale first used by Hayes and Patterson in 1921.[18] Number of centimeters marked was recorded as a score from 0 to 10: no pain= 0, moderate pain= 5, and severe pain intense enough to make the child cry= 10. Children and their families were taught in detail how to use VAS. Children were asked to mark the level of pain they experienced during the most recent attack.

Baseline information was collected from the patient after exploration of different complaints. Data were collected using a preformed data collection form and all information regarding clinical features was recorded.

All the relevant collected data were compiled on a master chart first and then statistical analysis was done using Microsoft Excel program.

Results

This study included 220 children with unexplained limb pain; among them, 161(73.2%) were diagnosed as growing pains and 59(26.8%) children had diseases other than GP. Juvenile Fibromyalgia syndrome was found in 11(5%), 8(3.6%) were Juvenile chronic arthritis and possible rheumatic fever each. Legg Calve Perthes disease and transient synovitis of hip were diagnosed in 5(2.3%) children. (Table I)

Table I

Diagnosis of unexplained limb pain (n=220).

Diagnosed diseases	Number	Percentage
Growing pains	161	73.2
Juvenile Fibromyalgia syndrome	11	5.0
Juvenile chronic arthritis	8	3.6
Possible rheumatic fever	8	3.6
Legg Calve Perthes disease	5	2.3
Transient synovitis of hip	5	2.3
Fracture	4	1.8
Accidents and sports injuries	4	1.8
Pronated feet	3	1.4
Flat foot	2	0.9
Osgood Schlatter disease	2	0.9
Undiagnosed	7	3.2
Total	220	100.0

A total of 161 children were diagnosed clinically as growing pains; among which boys were predominant (84 boys/ 77 girls); 52.2% children with GP were boys. Sixty percent of children with GP were between 5 to 8 years with a maximum 54(33.5%) in 5-6 years and 44(27.3%) in 7-8 years age group. The mean (mean ±SD) age of the study population was 7.05±2.32 years (range 3-12 years). (Figure 1).

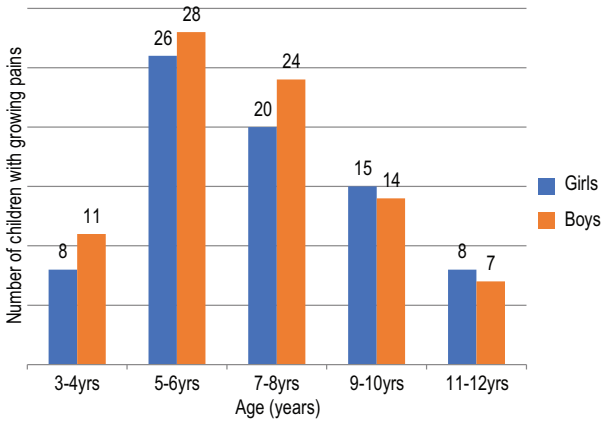

Figure 1: *Age and sex distribution of children with growing pains (n=161)*

Regarding the location of pain, 81(50.3%) children complained about pain over calf muscles followed by pain felt in popliteal regions 34(21.1%), over shins 23(14.3%) and front of

Table II

Clinical characteristics of growing pains (n=161).

Characteristics of pain	Frequency	Percentage
Site of pain		
Calf muscles	81	50.3
Popliteal	34	21.1
Shin	23	14.3
Front of thighs	21	13.0
Upper limbs	11	6.8
Joints	7	4.3
Foot	3	1.9
Timing of pain		
Night	108	67.1
Evening	47	29.2
Afternoon	6	3.7
Frequency of painful episodes		
Daily	54	33.5
Weekly	79	49.1
Monthly	23	14.3
3 monthly	5	3.1
Intensity of pain		
Mild	24	14.9
Moderate	96	59.6
Severe	41	25.5
Total duration of disease		
≤6 months	13	8.1
7-12 months	103	64.0
> I year	45	28.0
Duration of persistence of pain		
<30 minutes	51	31.7
30-60 minutes	61	37.9
>1 hour	49	30.4
Therapeutic modalities adopted		
Massaging	136	84.5
Oral anti-inflammatory analgesics	129	80.1
Warm compression	55	34.2
Rest	30	18.6
Stretching exercise	21	13.0
Topical analgesics	19	11.8
Application of bandage	12	7.5
Application of ice	9	5.6

thighs 21(13%). There was also overlapping of sites in some cases. Pain was more frequent at night time (in 67.1% children) and 29.1% experienced pain during evening. Painful episodes were experienced daily in 54(33.5%) children and 79(49.1%) complained about pain occurring several times a week. Intensity of pain was moderate in 96(59.6%) children whereas pain was severe enough to make the child cry in 41(25.5%) cases. Duration of the disease was 7-12 months in 103(64%) children followed by duration of more than one year in 45(28%). Painful episodes persisted for 30-60 minutes in 61(37.9%) children and duration was less than 30 minutes and more than one hour in 51(31.7%) and 49(30.4%) cases respectively. Massaging the affected site was the most effective measure adopted by 136(84.5%) for pain relieving followed by medication with oral anti-inflammatory analgesics 129(80.1%). Warm compression (34.2%), rest (18.6%), stretching exercise (13%), and application of topical analgesics (11.8%) were also adopted by the guardians (Table II).

Pain was associated with increased day-time physical activity among 63(39.1%) children and 14(8.7%) children were obese. History of unexplained limb pain or GP among siblings was positive in 39(24.2%) cases. Restlessness, headache, and abdominal pain were commonly associated problems occurring in 16(9.9%), 14(8.7%) and 5(3.1%) children respectively. Pain hampered the daily activities of 113(70.2%) patients with GP. Guardians complained that pain caused problems in sleep in 65(40.4%) children; normal schooling and sports were hampered in 29(18%) and 15(9.3%) children respectively (Table III).

Table III

Association of growing pains with other factors

Relationship with	Frequency	Percentage
other factors		
Obesity (BMI ≥95th centile)	14	8.7
Over-activity	63	39.1
History among siblings	39	24.2
Associated problems (n=35)		
Restlessness	16	9.9
Headache	14	8.7
Abdominal pain	5	3.1
Pain hampering activities (n=113)		
Sleep	65	40.4
Schooling	29	18.0
Sports	15	9.3
Feeding	4	2.5

BMI- Body mass index

Discussion

Growing pains was a frequent presenting complaint in paediatric outpatient departments in our study. Majority of the children with unexplained limb pain were diagnosed as growing pains and their demographic and clinical characteristics mostly correlated with reports of other studies.

Our study included 220 children with unexplained limb pain among whom about three-fourths (73.2%) were diagnosed as GP. This type of high frequency of growing pains in children with unexplained limb pain was also observed by Yousuf et al and Saha et al in Bangladesh and the frequency was even higher reported by Liao et al in Taiwan.[6,17,19] However, clinicians should be cautious in differentiating GP from other chronic musculoskeletal pain.

Growing pains mostly occurs in children between the ages of 3-12 years and the peak of incidence is found at 8-12 years.[10] In our study, one-third of children with GP were between 5 to 6 years of age and about 80% of children were between 5-10 years. The mean age of the study population was 7.05±2.32 years. There was a predominance of boys over girls (84/77). This finding correlates with the report of Haque et al, Liao et al and Li et al but is in contrast to girls' predominance reported by Saha et al, Yousuf et al and Asadi-Pooya et al.[5,6,17,19-21] Sex ratio may vary between studies due to the difference between the age range of the study population, and also lack the diagnostic criteria of GP adopted by different authors. In our settings, social background may also be a factor for male predominance where boys sometimes receive more attention regarding treatment seeking than girls in the family.

Pain was found bilateral in most of the cases. Majority of the children complained about pain over calf muscles; the other common sites were popliteal regions, over shins and front of thighs. This finding regarding the sites of pain is consistent with the reports of studies done in Bangladesh and other regions.[5,6,21] Pain intensity was assessed by VAS whenever possible from children who have adequate cognitive and physical development for understanding it or as complained by the attending guardians. Pain intensity was moderate in about sixty percent of children but in more than one-fourth of children, it was severe enough to make them cry in pain.

Among the therapeutic modalities adopted by the parents massaging the affected site and use of oral analgesics like acetaminophen or non-steroidal anti-inflammatory drugs (NSAIDs) were the most common ones. Different studies showed that massage was the most common method (66.6%-94%) for relieving pain which is consistent with the findings of our study where four out of five children needed this intervention.[5,6,21-23] Both oral and topical medication usage increased in the present study compared to previous studies in Bangladesh which mentioned that 52-57% of children used oral medication to relieve their pain.[5,24] The availability of these 'over-the-counter' drugs may be a logical reason behind this. On many occasions, the medications were advised by the guardians themselves and some were prescribed by local physicians. In about half of the patient massage and analgesics were used in combination.

About forty percent of parents reported that there were episodes of pain on the days of increased physical activities or sports. This finding signifies the theory that growing pains may represent local overuse syndrome leading to bone fatigue.[25] Normal daily activities were hampered by pain to some extent in about seventy percent of the study population especially in boys. Most guardians complained that pain caused problems in sleep and schooling of the children as they could not rise early to attend school in time and also learning time was hampered due to pain occurring at evening hours. Night-time feeding was found difficult occasionally in some children during painful episodes. The same type of disturbance in daily activities was reported in a study among school children by Haque et al in Bangladesh.[5] Findings of this study support that obesity, over-activity, and positive family history may be possible risk factors for GP in children.

Conclusion

Growing pains was the most common disease diagnosed among 73% of children with

unexplained limb pain. It was found prevalent in children of 4-8 years and more in boys. GP was mostly bilateral and pain felt over calf muscles. Daytime over-activity, obesity and positive family history may be the potential risk factors. Other demographic and clinical characteristics found in our study had similarities with the reports of other authors.

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Ethical Consideration
The protocol of this study was approved by the Ethical Review Committee of NCCRF&HD. Informed written consent was taken from authorized legal guardian of each child. Anonymity of patients and confidentiality of information were maintained strictly.

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Conflict of interest
We do not have any conflicts of interest.

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