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Shin splints among sports persons of different reputed clubs in Dhaka city

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Abstract

Sports injuries are the very common phenomenon among sports persons during the sports events. Among all kinds of lower leg injuries, shin splints is also occupied a noticeable extent. The aims of the study were to determine the prevalence and the associated risk factors of shin splints among the sports persons especially cricketers, footballers, tennis players and hockey players of

different sporting clubs in Dhaka City of Bangladesh. An analytical cross-sectional study was conducted among 116 sports persons to determine the prevalence and associated factors of shin splints. Data was collected with the help of interviewer administered structured questionnaire and the check-lists. Diagnosis was done by physiotherapist based on the specific criteria of signs and symptoms excluding fractures and compartmental syndrome. More than one quarter (25.9%) of players was suffering from shin splints, whereas, 3.4% had history (ever prevalence) of shin-splints. The significant risk factors for shin splints were: sports nature (p=0.002), average duration of playing in a day (p=0.001), maximum duration of playing without rest (p=0.001), and increased effort of playing (p=0.001). This study also reported shin splints as a major (68.0%) coverage among all kinds of lower leg pains. Prevalence of shin splints among the sports persons fairly high in Bangladesh which may lead early ending of their sports career. So, proper management and rehabilitation can help them to continue their playing for long time.

Key words: Sports injuries, shin splints, medial tibial stress syndrome, lower leg pain, sports person.

Introduction

Sports injuries are very communal factors for the persons involved in the sports. Almost all types of sports have chance to occur injuries. Sports injuries may be as acute injuries or macro-traumas, and it may also be chronic or overuse injuries or micro-traumas [1]. Injuries may be occurred in the various anatomical sites such as in the upper limb, lower limb, head and neck, back region with various kinds of injuries such as fractures, dislocation, sprain, strain, contusion, concussion, bruise, wound, black eye, back pain, chronic pain etc. basis of particular types of sports [2]. Overuse injuries are very common for the sports persons that generally occur when a structure is exposed to a large extent of repetitive forces causing a combined fatigue effect on muscles and then finally resulting effects on bones and periosteum for an over period of time that is beyond the capabilities of the structure [3]. Ten most frequently common overuse syndromes among sports persones are shin splints (medial tibial stress syndrome), pains of extension

mechanism of knee, achilles tendon peritendinitis, iliotibial tract friction syndrome, retrocalcaneal bursitis, metatarsal arch pains, stress fracture of tibia, planter fasciitis, Osgood-Sclatter's disease and chronic calf muscle pains [4]. Running is one of the most common physical activities for which overuse injuries are developed whereas shin splints one of the commonest one [3]. Study conducted among 2750 athletes and reported shin splints as the most common overuse injuries, and where bilateral shin-splints were founded in 32% of cases [4].

Shin splints, also known as medial tibial stress syndrome (MTSS) is the condition where pain is felt over the anterolateral, or the distal two third of the postero-medial aspect of the shin. Usually, these symptoms are present with activity and alleviated with rest [5]. There are various types of associated factors for developing shin splints. These may be variety of extrinsic and intrinsic factors. These may include sports types, sports nature, increased ground reactive-forces acting on the lower extremity, body mass index, legs length discrepancy, foot shape, rear foot angle, ankle and hip range of motion, duration, previous history, gender, fitness, training errors, use of orthotics etc. [5,6,7].

Prevalence and associated factors for shin splints are still unknown among Bangladeshi sports persons though few data are available in different countries. This study was aims to determine the proportion as well as to find out associated factors of shin splints among the Bangladeshi sports persons.

Methods and Materials

A cross-sectional study was conducted among different players (e.g. cricketers, footballers, tennis players and hockey players) from four different sporting clubs in Dhaka city (Bangladesh namely Abahoni Sporting Club, Sheikh Jamal Sporting Club, Bangladesh Hockey Federation and Bangladesh Tennis Federation). A total of 116 players (112 males and 4 females) aged between 18 to 50 years were interviewed for this study. The subjects who had any

deformity, lack of joint range of motion such as shoulder, trunk, hip, knee, ankle and subtalar joint, pregnant players were excluded from the study. An interviewer administered semi-structured questionnaire was used that had comprised 6 sections such as socio-demographic characteristics (age, sex, monthly income), physical measurements (height, weight), behavioral risk factors (smoking, alcohol, physical activity, dietary history), shin splints related questions (duration of pain, pain nature,) and factors associated with shin splints (stretching, warm up, playground condition etc.). Data collection procedure was face-to-face interview with the interviewer and physical examination by the physiotherapists. Diagnosis of shin splints was confirmed based on diagnostic criteria as few specific clinical symptoms for shin splints such as diffuse pain induced by exercise along the posterio-medial border of the tibia spread over a minimum of 5 cm (focal areas of only 2 to 3 cm are typical of stress fracture) and lasted for a few hours or days after exercise, and palpation of the posterio-medial border of the tibia produced pain and discomfort that was diffuse in nature and confined in the mentioned area, and again no history of paraesthesia or other symptoms indicative of other causes of exercise-induced pain [8, 9]. And, a naked eye evaluation was used to assess the gait pattern of the respondents. After collection of data, all the interviewed questionnaire were checked for its completeness, correctness and internal consistency to exclude missing or inconsistent data and those were discarded. Data were analyzed using SPSS version 16 for windows. Ethical approval was taken from the ethical review board of State College of Health Sciences. Both verbal and written consents were taken from the respondents prior to the data collection process.

Results

In this study, majority (96.6%, n=112) of the respondents were males. The mean age of the respondents was 23.83 (±5.78) years, whereas highest majority (70.7%) of the respondents was age between 18-25 years. Among them, 78.4% (n=91) of respondents were unmarried. More than two fifth (43.1%) of the respondents were completed their HSC level of education followed by 26.7% completed their graduation or above, and 21.6% completed their SSC. The median of monthly family income of the respondents was BDT 40,000.

Table 1: Association of shin splints with socio-demographic variables *(n=116)*

Variables	Shin Splints		χ^2	*p*-value
	Yes (%)	No (%)		
Gender[a]				
Male	25.9	74.1	0.002	1.000
Female	25.0	25.0		
Age				
18-25 years	23.2	76.8	1.057	0.304
26-50 years	32.4	67.6		
Marital Status				
Unmarried	23.1	76.9	1.708	0.191
Married	36.0	64.0		
Education				
Illiterate	0.0	100.0		
Primary	0.0	100.0		
Incomplete Secondary	14.3	85.7		
SSC	20.0	80.0	6.550	0.256
HSC	22.0	78.0		
Graduation/more	41.9	58.1		

p-value reached from Chi-square. 'a' indicated for using of Fisher's Exact Test. This study found no any significant association of shin splints with the socio-demographic factors of the respondents of this study.

The prevalence of lower leg pain was 37.9% (n= 44) and the prevalence of past but recovered lower leg pain was 5.2% (n= 6). Again, this study reported that a noticeable population among sports persons was suffering from shin splints. The prevalence of having shin splints among all the sports persons on that time was 25.9 % (n= 30), and the prevalence of past but recovered shin-splints was 3.4 % (n=4), whereas that current prevalence was greater among hockey players (34.6%) compared to cricketers (21.3%), footballers (28.6%) and tennis players (20.0%). This study has also been clearly found that, shin splints occupied a noticeable proportion of all lower leg pain (68.0%) considering the current and ever prevalence.

Regarding the anthropometric measurements, the mean body weight of the respondents was 62.87(±8.49) kg, mean height was 168.61(±8.18) cm and mean body mass index (BMI) was 22.67(±3.95), where according to WHO BMI category 11 persons (9.5%) were underweight (BMI <18.5), 84 persons (72.4%) were normal weight (BMI 18.5-24.9), 12 persons (10.3%) were overweight (BMI 25-29.9) and 9 persons (7.8%) were obese (BMI ≥30).

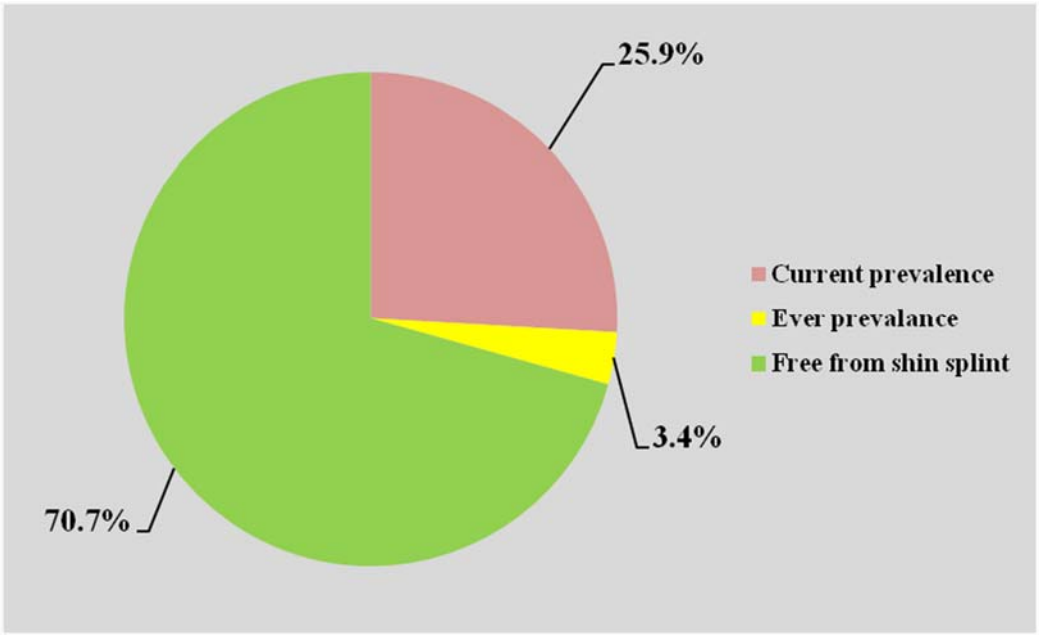

Figure: Prevalence of shin splints among the respondents

Majority of the respondents were non-smoker (80.2%, n=93) and non-alcohol consumer (95.7%, n=111) in this study. Again, near about two-fifth (37.9%, n=44) of the sports persons were used to follow their diet plan regularly, 19.8% (n=23) were as occasionally, 30.2% (n=35) were not used to follow at all and 12.1% (n=14) sports persons were not even consulted with dietitian yet. Water intake history was plenty for 81% (n=94) sports persons, moderate for 16.4% (n=19) persons and less intake history for 2.6% (n=3) persons.

In this study, distribution of type of sports among all the players, 40.5% (n=47) were cricketers, 24.1% (n=28) were footballers, 12.9% (n=15) were tennis players and 22.4% (n=26) were hockey players. 55.2% (n=64) reported their effort as moderate type and resting 44.8% (n=52) reported as vigorous type. The mean weekly involved days in the sports events was 5.53(±1.02) days, where that mean among cricketers was 5.45(±1.19) days, among footballers 5.89(±.074) days, among tennis players 5.33(±1.11) days and among hockey players

Table 2: Association of shin splints with anthropometrical and lifestyle related factors of the respondents *(n=116)*.

Variables	Shin Splints		χ^2	*p*-value
	Yes (%)	No (%)		
BMI				
Underweight	0.0	100.0		
Normal weight	27.4	72.6	5.564	0.135
Overweight	25.0	75.0		
Obese	44.4	55.6		
Smoking History				
Currently	35.0	65.0		
Previously	0.0	100.0	1.980	0.372
Never	24.7	75.3		
Alcohol Intake[a]				
Occasionally	60.0	40.0	3.176	0.108
Never	24.3	75.7		
Maintenance of Diet Plan				
Regularly				
Occasionally	25.0	75.0		
Don't follow	26.1	73.9	0.072	0.995
Didn't consulted with dietician	25.7 28.6	74.3 71.4		
Water Intake				
Plenty	26.6	73.4		
Moderate	26.3	73.7	1.075	0.584
Less	0.0	100.0		

p-value reached from Chi-square. 'a' indicated for using of Fisher's Exact Test. This study found no any significant association of shin splints with anthropometrical and life-style related factors of the respondents of this study.

5.42(±0.857) days. The mean value of duration of involvement in the sports events in a day was 3.68(±1.4) hours. Again, the mean value of maximum duration of involvement in the sports events without rest was 82.41(±67.20) minutes. Majority of the respondents (96.6%) were used to take warm-up and stretching regularly. 35.3% respondents reported their playground condition as smooth, 64.7% reported as hard. Again, majority (77.6%) reported their shoes were appropriately fitted with feet, and 15.5% of the respondents were having pes planus whereas pes cavus was not identified among them.

Table 3: Association of shin splints with sports related factors of the respondents *(n=116).*

Variables	Shin Splints		χ^2	*p*-value
	Yes (%)	No (%)		
Sports Type				
Cricket	21.3	78.7		
Football	28.6	71.4	1.930	0.587
Tennis	20.0	80.0		
Hockey	34.6	65.4		
Nature of Sports[a]				
Moderate	14.1	85.9	10.367	0.002*
Vigorous	40.4	59.6		
Warm Up[a]				
Regular	25.9	74.1	0.002	1.000
Irregular	25.0	75.0		
Stretching[a]				
Regular	25.9	74.1	0.002	1.000
Irregular	25.0	75.0		
Playground Condition[a]				
Smooth	29.3	70.7		
Hard	24.0	76.0	0.384	0.658
Recently Increased Performance[a]				
Yes	46.0	54.0		
No	10.6	89.4	18.587	0.001*
Shoes Fitness[a]				
Yes	23.3	76.7	1.339	0.309
No	34.6	65.4		
Pes Planus[a]				
Yes	38.9	61.1	1.886	0.239
No	23.5	76.5		

*p-value reached from Chi-square. * Mark represents significance of Chi-square. Study found significant association of shin splints with nature of sports (p-value* 0.002*) and recently increased performance (p-value* 0.001*).*

Those who had shin splint, among them more than half (56.7%) of respondents had history of bilateral shin splints and rest of them (43.3%) reported as unilateral. Majority (70.0%) of the respondent reported that they had acute pain, and rest of them (30.0%) had chronic pain. Again among them, 3.3% complained the pain feeling as always, 30.0% as during early of the sports events, 50.0% as after the sports events, 20.0% as during the whole sports events, 6.7% as during the initial steps from the bed, and also 6.7% as during others moments. According to the pain rating scale (PRS), the mean severity of feeling pain was 4.93(±1.46), whereas 50.0%

Table 4: Associated factors of shin splints among the respondents *(n=116).*

Variables	Shin Splints		t-value	*p*-value
	Yes *mean±SD*	No *mean±SD*		
Age	24.8±4.9	23.5±6.1	1.108	0.270
Monthly Family Income	58333.3±68836.8	45209.3±46222.0	1.170	0.244
Height	167.7±9.1	168.91±7.9	0.675	0.501
Weight	65.1±7.1	62.08±8.8	1.700	0.092
BMI	23.3±3.7	21.9±4.0	1.723	0.088
Weekly involved day in sports	5.8±0.8	5.5±1.1	1.448	0.150
Duration of sports in a day (in hours)	4.6±1.5	3.4±1.2	4.577	0.001*
Max. duration without rest in sports (in minutes)	148.3±87.1	59.4±38.1	5.412	0.001*

*t-value reached from independent sample t-test. * Mark represents significance of sample t-test. Study found significant association of shin splints with duration of sports in a day (p-value* 0.001*) and maximum duration of sports without rest (p-value* 0.001*).*

described their pain severity in the range between 4-5 values, 16.7% as between 2-3 values, and resting 33.3% as between 6-8 values. Along with the pain symptoms, there were also few other symptoms caused by the shin splints such as having swelling (13.3%), tenderness (70.0%), weakness and numbness (16.7%), and passive dorsiflexion (60%). Study showed that there were few variations in the impact of shin splints on sports performance among the shin splints affected players, whereas 50.0% mentioned as having no impact, 33.3% reported as less impact leading to slightly diminished sports performance, and resting 16.7% reported as severe impact leading to stop the sports performance. They were used to use a variety of remedies to reduce the pain, whereas 70.0% were used to take a rest to lessen the symptoms, 70.0% were used to as application of soft tissue massage on the affected area, 50.0% were used to as application of ice, 3.3% were used to as application of tapping, 3.3% were used to as continue the sports performance, and 23.3% were used to as application of other remedies. Among all the shin splints affected players, there was no any history of having bones related disorders diagnosed by any physician. Out of them all shin splints affected players, 36.7% had having history of taking

physiotherapy treatments, and resting 63.3% as no.

Discussion

This study has reported that, the current prevalence of shin splints among the players of these 4 sports categories as 25.9%, whereas this rate varies profession to profession such as incidence of 35% among naval recruits during their training session [7], 12.66% among the Australian defense members [6], 13% among runners and 22% among aerobic dancers [10]. And again, this study reported the ever prevalence was found as 3.4%, and on the other hand current prevalence rate was greater among the hockey players (34.6%) than cricketers (21.3%), footballers (28.6%) and tennis players (20.0%). This study also reported that, shin splints were identified as a major cause of all kinds of lower leg pain among the sports persons (68.0%), whereas other study reported shin splints as nearly 10% of all exertion injuries and about 60% of all kinds of leg pains [4].

Regarding the risk factors of shin splints, this study found no any significant association with socio-demographic characteristics of this study such as gender, age etc., and anthropometrical factors such as height, weight, BMI etc. and also with lifestyle related factors such as smoking, maintenance of diet plan, water intake etc., whereas others study found association with gender [7, 11] and body mass index [11]. Again, this study found significant association of shin splints with nature of sports such as moderate or vigorous type (p=0.002), average duration in a day (p=0.001), maximum duration without rest (p=0.001), recently increased sports performance (p=0.001). This study found no any significant association of shin splints with others sports related factors such as warm-up, stretching, playground condition, shoe fitness etc.

This study reported as the onset of pain for during early of the sports events, after the sports events, during the whole sports events, during the initial steps from the bed, always, and also reported as the pain relieving factors for taking rest, soft tissue massage, icing, tapping, continue the sports performance, whereas other study reported running as aggregating factor and rest as relieving factor [[12]]. Present study didn't find significant association of shin splints with

foot deformity like pes planus, and again sports persons with pes cavus were not found.

Conclusion

There is a very close relation between sports events and the sport injuries. Among the various patterns of sports injuries with the various types and nature of sports events, shin splints is very common condition as a lower leg injury. Data of the study represents a noticeable prevalence of shin splints among sports persons, whereas that prevalence was greater among the hockey players than the cricketers, footballers and also tennis players. Study also reported shin splints as greater cause of all kinds of lower leg injuries. Though this study found no significant association as risk factors of shin splints with socio-demographic characteristics, anthropometrical characteristics and life-style related factors, but found significant association with sports nature, average duration in a day, maximum duration without rest and recently increased sports performance. Therefore sports persons need to be more conscious and gaining adequate knowledge about the risk factors of shin splints, and should be conscious about the treatment and preventing measures. Limitations of the study included the radiological evidence to exclude stress-fractures and also small sample size. Again, further studies are needed to more precise determination of prevalence, incidence and the factors associated with Shin splints.

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