

Original Article

Clinical Pattern of Thoracic Spine Pain (TSP)

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Abstract

Thoracic spine pain (TSP) is defined as pain perceived anywhere in the region bounded superiorly by a transverse line through the tip of the spinous process of T1, inferiorly by a transverse line through the tip of the spinous process of T12, and laterally by vertical lines tangential to the most lateral margins of the erector spine muscles. One year prevalence of TSP ranged from 8.3-38.1% in different Asian countries. A longitudinal observational study was conducted to observe the clinical feature, demographic profile and clinical course of patients with TSP attending at the Department of Physical Medicine and Rehabilitation (PMR) of Shaheed Suhrawardy Medical College Hospital (ShSMCH). Among the 100 study patients mean age  $\pm$ SD was 34.76 $\pm$ 13.26. Highest number of the patients (45%) belong to 16-30 years age group and male-female ratio was 3:1. Highest frequency in the level of education 28% belonged to higher secondary or diploma. Twenty six percent (26%) patients were housewife, manual

labor 20%, students 19%, sedentary worker 15%, manufacturing and industrial worker 8%, health professional 4%, driver 3% and 5% were in others group. Most of them (71%) belong to <12000 taka monthly income group and 91% patients lived in urban area. Duration of thoracic spine pain was found acute (6 weeks) 46%, sub-acute (>6-12 weeks) 16% and chronic (>12 weeks) 38%. Upper TSP was found among 51% of the patients. Onset of pain among the patients 66% was gradual. Mild intensity of pain was reported in 54% patients, moderate 44% and severe in only 2% patients and 64% patients had no radiation. Aggravating factors were found in patients with prolonged sitting in 42%. More than one third (36%) patients relieving factor were lying, 24% rest, activity 16% and no relieving factors in 24% patients. Morning stiffness and depression was found 20% and 25% patients respectively. Associated conditions were found as diabetes mellitus (DM) 25%, sleep disturbance 16%, dyspepsia 10%, hypertension (HTN) were in 7% patients and 42% patients had no associated condition. Large number of the patients' was occupational 46%; rest of the factors were MFPS 16%, degenerative 14% (dorsal spondylosis 5%, cervical spondylosis 6% and lumbar spondylosis 3%), Ankylosing Spondylitis (AS) 7% and traumatic were 6%. Pott's disease 4% and 7% patients' cause were others. According to Numeric Rating Scale in the first visit mild causes were in 54% patients, 44% moderate and 2% severe. In the last visit 69% patients were found mild and rest had no pain ( $p$  value=0.001). Assessment of joint tenderness in first visit; 56% patients were in grade 1, 20% grade 2 and 3% in grade 3, 21% patients had no tenderness. In the last visit it was found that only 21% patients in grade 1 and rest 79% had no tenderness ( $p$  value=0.001). According to Pain Disability Index in the first visit mild disability was found in 67% patients, moderate 31% and 2% had no disability. In the last visit mild were 74% and 26% had no disability ( $p$  value=0.001). Teenager, young adults and adults were the most commonly affected patients with TSP with M:F=1.5:1. Most of the patient of upper TSP presented before 6 weeks; common presenting features were gradual onset, pain was constant in nature, mild to moderate in intensity without radiation, aggravated by prolonged sitting and leaning forward, relieved by lying and rest, with no depression and significant morning stiffness. Most of the factors were occupational and MFPS. Occupations were commonly housewife and manual labor. They were improved significantly ( $p$  value=0.001) with conventional treatment.

**Keywords:** Thoracic spine pain (TSP), myofascial pain syndrome (MFPS).

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## INTRODUCTION

Thoracic spine pain (TSP) is considered to be pain perceived anywhere in the region bounded superiorly by a transverse line through the tip of the spinous process of T1, inferiorly by a transverse line through the tip of the spinous process of T12, and laterally by vertical lines tangential to the most lateral margins of the erector spine muscles<sup>1</sup>. TSP may arise from thoracic and cervical spinal structures, thorax, gastrointestinal, cardiopulmonary and renal systems.<sup>1,2,3</sup> Thoracic spine is a common site for inflammatory, degenerative, metabolic, infective, neoplastic, osteoporosis, vertebral fractures,<sup>4-7</sup> hyperkyphosis, ankylosing spondylitis, osteoarthritis and Scheuermann's disease.<sup>8-11</sup> However, TSP is common in different countries of the world in different settings. One meta-analysis (52 studies describing 65 cohorts and out of this 11 cohorts from Asia) showed that one year prevalence of TSP ranged from 3.0-55.0%, with most occupational groups having medians around 30%.<sup>12</sup> One year prevalence of TSP among physicians is 29% in China<sup>13</sup>, among female hospital nurses 8.3% in Taiwan<sup>14</sup> and 37% in China,<sup>15</sup> among male rubber factory workers 38.1% in Iran<sup>16</sup>. TSP is common in youth and has an increasing incidence with age during adolescence.<sup>17,18</sup> One study<sup>17</sup> reported that back pain in children is most common in the middle back area, whereas in adolescence middle back pain and low back pain are equally common.

Spinal pain is a common condition associated with significant personal and community burdens. Very few research work was done on thoracic spine in comparison to lumbar and cervical spine.<sup>19</sup> TSP is equally disabling, imposing similar burdens on the individual, community and workforce.<sup>12,19-21</sup> Societal cost of spinal pain is about 1% of gross national product per annum.<sup>22</sup> An advanced google search has been made using key words prevalence of thoracic spine pain, upper back pain in Bangladesh and no specific data is found in any article or abstract. So detailed knowledge about the demographic profile and pattern of TSP is very important for proper management including rehabilitation.

## MATERIAL AND METHODS

This Longitudinal Observational Study was carried out in the department of Physical Medicine & Rehabilitation of Shaheed Suhrawardy Medical College Hospital (ShSMCH) during July 2015 to December 2015. Patients presented with thoracic spine pain (TSP) were recruited in this study. History taking, physical examination and

baseline investigations were done for every consecutive patient to reach a diagnosis. All cases were checked for eligibility criteria (inclusion & exclusion criteria) and those found eligible were approached for informed consent by the investigator.

### Inclusion criteria:

- a) Patients with thoracic spine pain of any duration.
- b) Age group 16-75 years.

### Exclusion criteria:

- a) Patients with co-morbidities like IHD, COPD, bronchial asthma, pneumonia, CLD, renal failure.
- b) Patients of remote area who will not be able to come for follow up visit.

One hundred ten (110) cases were enrolled for the study from ShSMCH, among them 95 cases from outpatient and 15 cases from inpatient department. The pre-designed semi-structured questionnaire was used for all cases. A face to face interview with the cases were carried out for filling up the questionnaire. The minimum time to take an interview was one (1) hour. Then they were given conventional treatment according to their diagnosis. Treatment modalities include rest for acute and traumatic pain. NSAID-local & systemic and other drugs like muscle relaxant, anti-depressant, calcium supplementation, vitamin D, bisphosphonates, anti-TB drugs according to cause of pain. Physical therapy-superficial heat, deep heat like SWD, MWD. Upper back pain rehabilitation exercises like pectoralis stretch, thoracic stretch, thoracic extension, arm slides on wall, scapular squeezes, mid-trap, rowing-all these exercises done 2-3 sets of 10 daily. Besides spinal mobilization, exercises for scoliosis, aerobic exercises were given. Spinal bracing was also given when indicated. General measures like postural correction, avoid carrying heavy loads, weight reduction, dietary modification, stop smoking/alcohol were advised. Patients were evaluated clinically and by standardized assessment tools at enrolment and followed up at 7 days interval for one visit, two weekly for three visits (total four visits). Assessments were included baseline demographics, clinical findings and disabilities. The tools used for measurement of pain intensity, tenderness and disability were Numeric Rating Scale (NRS-11).<sup>23</sup> Assessment of tenderness,<sup>24</sup> Pain Disability Index

(PDI)<sup>25</sup>. Information obtained from history, physical examination and assessment tools were recorded in patients' data sheet.

Collected data was sorted and screened for any discrepancy and edited for finalized result. After editing and coding, the coded data were analyzed by SPSS<sup>®</sup>16. Results on continuous measurements were presented on mean ± SD (min-max) and results on categorical measurements were presented in number (%). Descriptive statistical analysis was done where P- value (<0.05) was considered as significant. Student 't' test was done to see the level of significance.

**OPERATIONAL DEFINITIONS:**

Acute, sub-acute and chronic TSP: Acute TSP present for up to six weeks. Sub-acute TSP present with duration of greater than six weeks after injury but no longer than 12 weeks after onset of symptoms. Chronic TSP present for more than 12 weeks.<sup>26</sup>

Myofascial pain syndrome (MFPS): MFPS is a form of myalgia that is characterized by local regions of muscle hardness that are tender and that cause pain to be felt at a distance, i.e., referred pain. The central component of the syndrome is the trigger point that is composed of a tender, taut band<sup>27</sup>. Patients with MFPS often report regional, persistent pain that usually results in a decreased range of motion of the muscle in question.<sup>28</sup> So according to operational definition of TSP, trigger points situated in the inter-scapular area were included in the study.

Occupational TSP: Occupational thoracic spine pain can be defined as pain experienced in the region of upper back or middle back from repetitive movement or prolong bad posture during various occupation.<sup>29,30</sup>

**RESULTS**

Of the 110 subjects enrolled in the study, 3 subjects lost at 3<sup>rd</sup> follow up visit and 7 subjects were lost at 4<sup>th</sup> follow-up visit. Finally 100 patients evaluated and analyzed according to objectives. The findings are presented through tables, graphs and organized as below:

Table-I shows that the Mean SD age among the patients was 34.76±13.26. Highest 45% patients belong to 16-30 years age group. Rest 35%, 18% and 2% were belonged to 31-45, 46-60 and 61-75 years age group respectively. The study shows 60% patients were male and 40% were female with M:F = 1.5:1.

**Table-I Age distribution**

Age group			
Age group	Frequency	Percent (%)	Mean SD
16-30 years	45	45	34.76±13.26
31-45 years	35	35	
46-60 years	18	18	
61-75 years	2	2	
Total	100	100	

Table-II shows that among the study patients highest frequency 28% belonged to higher secondary or diploma level. Primary 27%, secondary 25%, illiterate 17% and graduate or more were 3% respectively.

**Table-II Distribution of educational level**

Education	Educational level	
	Frequency	Percent (%)
Illiterate	17	17
Primary	27	27
Secondary	25	25
Higher Secondary or diploma	28	28
Graduate or more	3	3
Total	100	100

Table-III shows that maximum 26% patients were housewife. Among the rests manual labor 20%, students 19%, sedentary worker 15%, manufacturing and industrial worker 8%, health professional 4%, driver 3% and 5% were in others group.

**Table-III Distribution of occupation**

Occupation	Occupation	
	Frequency	Percent (%)
Housewife	26	26
Manual labor	20	20
Student	19	19
Sedentary worker	15	15
Manufacturing and industrial worker	8	8
Health professional	4	4
Driver	3	3
Others	5	5
Total	100	100

Among the patients 86.0% were married and 14.0% were unmarried. Ninety one percent (91%) patient's residences were in urban area and 9% were from rural area.

Table-IV shows that most of the patients (71.0%) belong to <12000-taka monthly income group. Others 19.0% were 12001-25000, 6.0% were 25001-40000 and 4.0% were above 40,000 taka monthly income group.

**Table-IV Monthly income status of the population**

Monthly Income	Monthly Income	
	Frequency	Percent (%)
<12000	71	71
12001-25000	19	19
25001-40000	6	6
Above 40000	4	4
Total	100	100

Table-V shows that among the patients the mean duration of thoracic spine pain was 1.80±0.889. Acute TSP was found 46%, sub-acute 16% and chronic in 38% patients.

**Table-V Distribution of TSP duration**

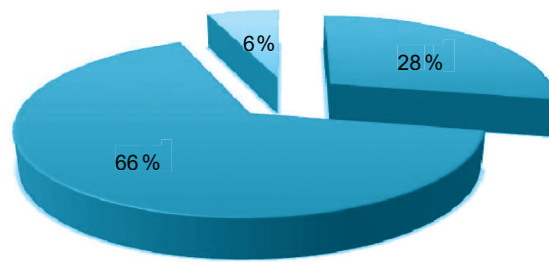
TSP Duration	Thoracic spine pain duration		
	Frequency	Percent (%)	Mean±SD
Acute (6 weeks)	46	46	1.80±0.889
Sub-acute (>6-12 weeks)	16	16	
Chronic (>12 weeks)	38	38	
Total	100	100	

Table-VI shows that most of the patient's site of pain were (51%) upper TSP. Among the others right sided TSP 18%, left sided TSP 17%, widespread TSP 9% and lower TSP 5% respectively.

**Table-VI Distribution of site of pain**

Site of Pain	Site of pain	
	Frequency	Percent (%)
Upper TSP	51	51
Lower TSP	5	5
Right sided TSP	18	18
Left sided TSP	17	17
Widespread TSP	9	9
Total	100	100

**Onset of pain among the patients**



**Figure-1 Onset of pain distribution**

Figure-1. shows onset of pain among the patients 66% were gradual. Sudden and after trauma onset pain were 28% and 6% respectively.

Table-VII shows character of pain according to chronicity among the patients 52% were constant, intermittent 27%, recurrent 20% and episodic 1% respectively.

**Table-VII**

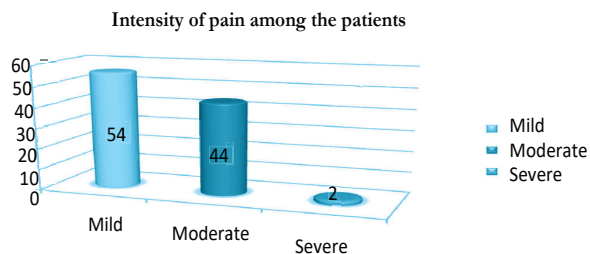
Distribution of character of pain according to chronicity.

Character of pain according to chronicity		
Character of Pain	Frequency	Percent (%)
Constant	52	52
Intermittent	27	27
Recurrent	20	20
Episodic	1	1
Total	100	100

Table-VIII shows nature of pain among the patients 57% was dull, burning 27% and stabbing 16% respectively.

**Table-VIII Distribution of nature of pain.**

Nature of Pain		
Character of Pain	Frequency	Percent (%)
Dull	57	57
Burning	27	27
Stabbing	16	16
Shooting	0	0
Total	100	100



**Figure-2** Distribution of intensity of pain

Figure-2 shows intensity of pain among the patients were mild 54%, moderate 44% and severe 2% respectively.

Table-IX shows 64% had no radiation. Radiation of pain on neck had 4%, low back region 18% and shoulder 14% respectively.

**Table-IX** Distribution of radiation of pain

Radiation of pain		
Radiation of pain	Frequency	Percent (%)
Neck	4	4
Low back region	18	18
Shoulder	14	14
None	64	64
Total	100	100

Table-X shows aggravating factors among the patients 42% were prolong sitting, 15% and 30% were prolong walking and leaning forward. Only 2% patients aggravating factors were empty stomach and rich diet each. Nine percent (9%) patients had no aggravating factor.

**Table-X** Distribution of aggravating factors

Aggravating Factor		
Aggravating Factor	Frequency	Percent (%)
Prolong sitting	42	42
Prolong walking	15	15
Leaning forward	30	30
Empty stomach	2	2
Rich diet	2	2
None	9	9
Total	100	100

The table-XI shows that 36% patients relieving factor were lying, 24% rest, activity 16% and no relieving factor for 24% patients.

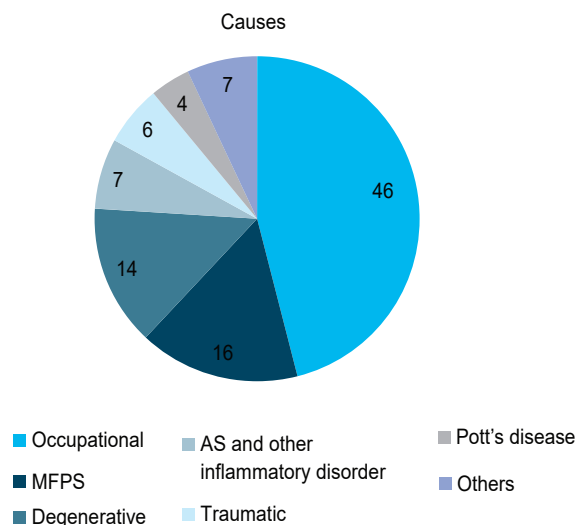
**Table-XI** Distribution of relieving factors

Relieving Factor		
Relieving Factor	Frequency	Percent (%)
Rest	24	24
Lying	36	36
Activity	16	16
None	24	24
Total	100	100

Table-XII shows associated condition among the patients 42% had no associated condition. DM 25%, sleep disturbance 16%, dyspepsia 10% and HTN were in 7% patients respectively. This study also shows 20% patient had morning stiffness and 25% had depression among all patients respectively.

**Table-XII** Distribution of associated condition

Associated Condition		
Associated Condition	Frequency	Percent (%)
Sleep disturbance	16	16
DM	25	25
HTN	7	7
Dyspepsia	10	10
None	42	42
Total	100	100



**Figure-3** Distribution of causes of TSP

Figure-3 shows most of the patients' cause was occupational 46%. Rest of the causes were MFPS 16%, degenerative 14% (dorsal spondylosis 5%, cervical spondylosis 6% and lumbar spondylosis 3%), Ankylosing Spondylitis (AS) and other inflammatory disorder 7% and Traumatic were 6%. Pott's disease 4% and 7% patients' causes were others. Among others group, Dyspepsia were 3%, Kyphoscoliosis 1%, Kyphosis 1%, Odynophagia 1% and Osteoporotic fracture 1% respectively.

Table-XIII according to Numeric Rating Scale (0-10) at enrollment 54% patients were mild, 44% moderate and 2% severe. In the last visit (week-7) it was found that 69% patients were mild and rest 31% had no pain. This status was statistically significant (p=0.001).

**Table-XIII TSP according to Numeric Rating Scale (0-10)**

Numeric Rating Scale (0-10)			
Numeric Rating Scale	Frequency (%)		P value
	First Visit Day-1	Last Visit Week-7	
No Pain (0)	0 (0%)	31(31%)	0.001
Mild (1-3)	54(54%)	69(69%)	
Moderate (4-6)	44(44%)	0(0%)	
Severe (7-10)	2(2%)	0(0%)	
Total	100 (100%)	100(100%)	

According to Assessment of Joint Tenderness Table-XIV shows at enrollment 56% patients were in grade 1, 20% grade 2 and 3% in grade 3, 21% patients had no tenderness. In the last visit (week-7) it was found that only 21% patients in grade 1 and rest 79% had no tenderness. This status was statistically significant (p=0.001).

**Table-XIV TSP according to Assessment of Tenderness**

Assessment of Tenderness			
Assessment of Tenderness	Frequency (%)		P value
	First Visit Day-1	Last Visit Week-7	
No tenderness	21 (21%)	79(79%)	0.001
Grade 1	56(56%)	21(21%)	
Grade 2	20(20%)	0(0%)	
Grade 3	3(3%)	0(0%)	
Grade 4	0(0%)	0(0%)	
Total	100 (100%)	100(100%)	

Table-XV shows mild disability were found in 67% patients, moderate 31% and 2% had no disability. In the last visit (week-7) mild were 74% and 26% had no disability according to Pain Disability Index at enrollment. This status was statistically significant (p=0.001).

**Table-XV TSP according to Pain Disability Index**

Pain Disability Index			
Pain Disability Index	Frequency (%)		P value
	First Visit Day-1	Last Visit Week-7	
No disability (0)	2(2%)	26(26%)	0.001
Mild (1-28)	67(67%)	74(74%)	
Moderate (29-49)	31(31%)	0(0%)	
Severe (50-70)	0(0%)	0(0%)	
Total	100(100%)	100(100%)	

**DISCUSSION**

This study was conducted in a tertiary care hospital in Dhaka city. One hundred (n=100) patients with thoracic spine pain (TSP) attending in the Department of Physical Medicine and Rehabilitation (PMR) of Shaheed Suhrawardy Medical College Hospital (ShSMCH) were selected for the study during a period of six months from July 2015 to December 2015.

The demographic characteristic of study people found Mean±SD age among the patients was 34.76±13.26. Most of the patients 45% belong to 16-30 years age group. Rest 35%, 18% and 2% were belong to 31-45, 46-60 and 61-75 years age group respectively. One study<sup>31</sup> reported mean age was 47.1 (±20.2) years among 300 patients age ranged from 13 years to 78 years (range 65 years). Age composition of their study population showed that 30% of patients were more than 60 years and 65% of patients were in the age-group of 40- 60 years. Only 5% of patients belonged to less than 40 years group.

In the current study among 100 patients 60% were male and 40% were female. Male and female ratio was 1.5:1. A study<sup>32</sup> showed male 71.09% and 28.9% were female patients.

Among the study patients highest frequency 28% belonged to higher secondary or diploma level. Primary 27%, secondary 25%, illiterate 17% and graduate or more were 3% respectively. One study<sup>31</sup> showed the educational level of the patients (expressed in terms of

number of completed years of formal institutional education) ranged from 0 (illiterate) to 17 years the mean being 8.3 ( $\pm 5.1$ ) years.

In current study most of the patients (26%) were housewife. Among the rests manual labor 20%, students 19%, sedentary worker 15%, manufacturing and industrial worker 8%, health professional 4%, driver 3% and 5% were in others group. In others group there were players, military personnel, performing artists and others occupation excepting the listed occupation in the study. Almost half of the male patients were agriculture worker by profession while more than two-third of the female patients were household worker found in a study<sup>31</sup>.

Most of the patients 86% were married and 14% were unmarried found in our study. Highest 71% patients belong to <12000 taka monthly income group. Others 19% were 12001-25000, 6% were 25001-40000 and 4% were above 40000 taka monthly income group. In a study<sup>31</sup>, per capita monthly income of the patients ranged from Rs.2000 to Rs.7200, the mean being Rs.6610 ( $\pm 2842.8\%$ ) and the median being Rs.6000.

Among the studied patients 91% residences were in urban area and 9% were from rural area. One study<sup>31</sup> showed patients coming from urban areas were 61% whereas 39% patients belonged to rural areas.

Among the patients the mean duration of thoracic spine pain was  $1.80 \pm 0.889$ . Acute TSP was found 46%, sub-acute 16% and chronic in 38% patients. One study<sup>33</sup> found eight patients with an acute presentation (3.8%) included 4 men and 4 women with a mean age of 53 years (range 38-76 years), whereas 201 patients without an acute presentation included 82 men and 119 women with a mean age of 49.2 years (range 23-83 years).

Most of the patient's site of pain were (51%) upper TSP. Among the others rights sided TSP 18%, left sided TSP 17%, widespread TSP 9% and lower TSP 5% respectively. One article reported some causes of right upper back pain and left upper back pain<sup>34</sup> but these causes are not included in the current study. Onset of pain among the patients 66% was gradual. Sudden and after trauma onset pain were 28% and 6% respectively. Character of pain according to chronicity among the patients 52% were constant, intermittent 27%, recurrent 20% and episodic 1% respectively. Fifty seven percent (57%) patients' nature of pain was dull, 27% burning and stabbing 16%. According to history of patient mild

intensity of pain among the patients was 54%, moderate 44% and severe 2%. No radiation was found in 64% patients. Radiation of pain on neck had 4%, low back region 18% and shoulder 14%. Aggravating factors like prolong sitting were 42%, prolong walking 15% and 30% were leaning forward. Only 2% patients aggravating factors were empty stomach and rich diet. Nine percent (9%) patients had no aggravating factors. Thirty six percent (36%) patients' relieving factor were lying, 24% rest, activity 16% and no relieving factors were found in 24% patients. Morning stiffness and depression was found 20% and 25% patients respectively.

Most of the patients (42%) had no associated condition. Among the others DM 25%, sleep disturbance 16%, dyspepsia 10% and HTN were in 7% patients respectively. One study<sup>35</sup> found hypertension 30%, diabetes 24.7% and rheumatoid arthritis 13.3%, the three most commonly associated disease conditions.

Most of the patients' cause was occupational 46%. One meta-analysis<sup>12</sup> showed one year prevalence of TSP ranged from 3.0-55.0%, with most occupational groups having medians around 30% which did not differ much with this study. This implies that occupational TSP is prevalent in both developed and developing countries.

Second most common cause was MFPS 16%. One study<sup>36</sup> reported 0.45% prevalence of MFPS in the rural community of Bangladesh. The difference may be due to the sample taken in the current study is not representative of the rural community as 91% patients' residences were in urban area.

In the present study degenerative causes were 14% (dorsal spondylosis 5%, cervical spondylosis 6% and lumbar spondylosis 3%). One study<sup>37</sup> reported the prevalence of disc degeneration (DD) over the entire spine was 71% in men and 77% in women aged <50 years and >90% in both men and women aged >50 years. The prevalence of an intervertebral space with DD was highest at C5/6 (men 51.5%, women 46%), T6/7 (men 32.4%, women 37.7%) and L4/5 (men 69.1%, women 75.8%)<sup>37</sup>. The high prevalence possibly due to sample taken from the population irrespective of symptoms and definite spinal pathology on MRI in the thoracic spine in asymptomatic individuals is also prevalent<sup>38</sup>.

The current study showed the prevalence of Ankylosing Spondylitis (AS) and other inflammatory disorder was 7%. Another study<sup>39</sup> reported 11.03% were inflammatory

arthritis and out of this AS was 28.89%, studied in the department of Physical Medicine & Rehabilitation, Chittagong Medical College Hospital (CMCH), Bangladesh. Globally the mean prevalence<sup>40</sup> of AS per 10,000 in Asia was 16.7, in Europe 23.8, in North America 31.9, in Latin America 10.2 and 7.4 in Africa.

This study showed traumatic cause was 6% and Pott's disease 4%. One retrospective cross-sectional study of the spinal injury patients in the Spine Unit of Bangabandhu Sheikh Mujib Medical University (BSMMU) Hospital reported that traumatic spinal injury affected the thoracic spine in 13.54%, thoraco-lumbar 06.25% and cervico-thoracic region 03.13% cases<sup>35</sup>. Majority of the tuberculous spondylitis involved the thoracic spine (30.3%)<sup>41</sup>.

Among others group (7%), Dyspepsia were 3%, Kyphoscoliosis 1%, Kyphosis 1%, Odynophagia 1% and Osteoporotic fracture 1% respectively. One study<sup>39</sup> reported the prevalence of osteoporosis about 1.63% in CMCH, Bangladesh. Approximately 25% of all postmenopausal women in the USA get a compression fracture during their lifetime. The prevalence of this condition increases with age, reaching 40% by age 80<sup>42</sup>. There is no widely-accepted definition of hyperkyphosis, and therefore the prevalence of hyperkyphosis in older persons is not precisely known. However, the current estimates range between 20 and 40 percent among community-dwelling individuals aged  $\geq 60$  years<sup>43</sup>.

According to Numeric Rating Scale (0-10) in the first visit 54% patients were mild, 44% moderate and 2% severe. Three percent (3%) patients had no pain. In the last visit it was found that 69% patients were mild and rest had no pain. One study<sup>30</sup> showed that the baseline pain score mean (SD) was 5.6(2.0) and in the last visit 3.4(2.4) indicating moderate intensity in both settings according to Visual Analogue Scale (VAS). Both of the studies show significant improvement in pain intensity ( $p < 0.05$ ).

Assessment of Joint Tenderness in first visit 56% patients were in grade 1, 20% grade 2 and 3% in grade 3, 21% patients had no tenderness. In the last visit it was found that only 21% patients in grade 1 and rest 79% had no tenderness. These results show significant improvement in joint tenderness ( $p = 0.001$ ).

In the first visit rating of Pain Disability Index were found mild 67%, moderate 31% and 2% had no disability. In

the last visit mild were 74% and 26% had no disability. Baseline disability score mean (SD) was 28.5(10.4) indicating moderate disability and in the last visit 17.8(15.2) indicating mild disability according to Oswestry Disability Index (0-100 ODI) modified for thoracic spine pain. Both the study results show significant improvement in their disability ( $p < 0.05$ ) found in a article<sup>30</sup>.

## CONCLUSIONS

This study revealed that maximum 45% patients belonged to 16-30 years age group and mean  $\pm$  SD age was 34.76  $\pm$  13.26. Teenager, young adults and adults were the most commonly affected patients with M:F=1.5:1. Most of the patient of upper TSP presented before 6 weeks; common presenting features were gradual onset, constant, mild to moderate, without radiation, aggravated by prolong sitting and leaning forward, relieved by lying and rest. Frequent associated conditions were none, dyspepsia, DM with no depression and significant morning stiffness. Common causes were occupational and MFPS. Most of the patients were married, completed primary and secondary level of education, monthly income <12000 taka and inhabitants of urban area. Occupations were commonly housewife and manual labor. Patients' pain, tenderness and disability were mild at enrollment and significantly improved ( $p = 0.001$ ) after seven weeks of conventional treatment in most of the cases.

## RECOMMENDATION

Further multicenter descriptive and analytical studies with larger sample size that may be representative of total population are warranted to establish the clinical pattern of thoracic spine pain.

## REFERENCES

1. Australian Acute Musculoskeletal Pain Guidelines Group: Evidence-based management of acute musculoskeletal pain. A guide for clinicians Brisbane: Australian Academic Press. National Health and Medical Research Council (Australia), 2004.
2. Fruth SJ. Differential diagnosis and treatment in a patient with posterior upper thoracic pain. *Phys Ther* 2006; 86: 254-268.
3. Fukui S, Ohseto K, Shiotani M. Patterns of pain induced by distending the thoracic zygapophyseal joints. *Reg Anesthesia* 1997; 22: 332-336.



4. Briggs AM, Greig AM, Wark JD. The vertebral fracture cascade in osteoporosis: A review of aetiopathogenesis. *Osteoporos Int* 2007; 18: 575-584.
5. Cockerill WC, Ismail AA, Cooper C, Matthis C, Raspe H, Silman AJ, O'Neill TW. Does location of vertebral deformity within the spine influence back pain and disability? European Vertebral Osteoporosis Study (EVOS) Group. *Ann Rheum Dis* 2000; 59: 368-371.
6. Ettinger B, Black D, Nevitt MC, Rundle AM, Cauley JA, Cummings SR, Genant HK. Contribution of vertebral deformities to chronic back pain and disability. *J Bone Miner Res* 1992; 7: 449-455.
7. Johansson C, Mellstrom D, Rosengren K, Rundgren A. A community-based population study of vertebral fractures in 85yearold men and women. *Age and Ageing* 1994; 23: 388-392.
8. Kado DM, Prenovost K, Crandall C. Narrative review: Hyperkyphosis in older persons. *Ann Int Med* 2007; 147: 330-338.
9. Sampaio-Barros PD, Bertolo MB, Kraemer MHS, Neto JFM, Samara AM. Primary ankylosing spondylitis: Patterns of disease in a Brazilian population of 147 patients. *J Rheum* 2001; 28: 560-565.
10. Kramer PA. Prevalence and distribution of spinal osteoarthritis in women. *Spine* 2006; 31: 2843-2848.
11. Murray PM, Weinstein SL, Spratt KF. The natural history and long term follow up of Scheuermann kyphosis. *J Bone Joint Surg (American)* 1993; 75A: 236-248.
12. Briggs AM, Bragge P, Smith AJ, Govil D, Straker LM. Prevalence and associated factors for thoracic spine pain in the adult working population. A literature review. *J Occup Health* 2009; 51: 177-192.
13. Smith DR, Wei N, Zhang YJ, Wang RS. Musculoskeletal complaints and psychosocial factors among physicians of mainland China. *Int J Ind Ergon* 2006; 36: 599-603.
14. Hou J, Shiao JS. Risk factors for musculoskeletal discomfort in nurses. *J Nursing Res* 2006; 14: 228-36.
15. Smith DR, Wei N, Zhao L, Wang RS. Musculoskeletal complaints and psychosocial risk factors among Chinese hospital nurses. *Occup Med (Oxford)* 2004; 54: 579-82.
16. Choobineh A, Tabatabaei SH, Mokhtarzadeh A, Salehi M. Musculoskeletal problems among workers of an Iranian rubber factory. *J Occup Health* 2007; 49: 418-23.
17. Wedderkopp N, Leboeuf-Yde C, Andersen LB, Froberg K, Hansen HS. Back pain reporting pattern in a Danish population-based sample of children and adolescents. *Spine* 2001; 26: 1879-1883.
18. Grimmer K, Nyland L, Milanese S. Repeated measures of recent headache, neck and upper back pain in Australian adolescents. *Cephalgia* 2006; 26:843-851.
19. Edmondston SJ, Singer KP. Thoracic spine: anatomical and biomechanical considerations for manual therapy. *Man Ther* 1997; 2: 132-143.
20. Austin GP, Benesky WT. Thoracic pain in a collegiate runner. *Man Ther* 2000; 7: 168-172.
21. Briggs AM, Straker LM. Thoracic spine pain in youth: Should we be concerned? *Spine Journal* 2009; 9:338-339.
22. Hansson EK, Hansson TH. The costs for person's sick-listed more than one month because of low back or neck problems: A two-year prospective study of Swedish patients. *Eur Spine J* 2005; 14: 337-45.
23. Kumar P, Tripathi L. Challenges in pain assessment: Pain intensity Scales. *Indian J Pain* 2014; 28: 61-70.
24. Hutchison R, Rainy H. Assessment of Joint Tenderness. In: Swash M, ed. *Hutchison's Clinical Methods*. 21st ed. London: Harcourt; 2002: 200-201.
25. Chibnall JT Tait RC. The Pain Disability Index: Factor Structure and Normative Data. *Arch Phys Med Rehabil*. 1994; 75: 1082-1086.
26. Guide-- Adult Acute and Subacute Low Back Pain: Health Care Guideline. Institute for Clinical Systems Improvement, 2012.
27. S. Mense and R.D. Gerwin (eds.), *Muscle Pain: Diagnosis and Treatment*, DOI 10.1007/978-3-642-05468-6\_2, # Springer-Verlag Berlin Heidelberg 2010.

28. Trigger Points: Diagnosis and Management - American Family Physician [www.aafp.org](http://www.aafp.org) › Journals › afp › Vol. 65/No. 4(February 15, 2002) (viewed on 11th Sept 2016).
29. High-risk Jobs: Is Your Job Putting Your Spine at Risk?-Workplace [www.spineuniverse.com](http://www.spineuniverse.com) › Wellness › Ergonomics Aug 17, 2015 (accessed on 19th Sept 2016).
30. Crothers et al. Spinal manipulative therapy, Graston technique and placebo for non-specific thoracic spine pain: a randomized controlled trial. *Chiropractic & Manual Therapies* (2016) 24:16 DOI 10.1186/s12998-016-0096-9.
31. Ahana Chatterjee et al. Various Pathologies Causing Shoulder Pain: Their Relations with Demographic Parameters and Co- morbidities, *IJPMR* 2008;19 (2): 32-36.
32. Huda N, Gupta P, Pant A et al. Pattern of Orthopaedic injuries among patients attending the emergency department in a tertiary care hospital – An analytical study. *Acta Medica International*. 2014; 1(1):10-14.
33. Erwin M. J. Cornips, Marcus L. F. Janssen, and Emile A. M. Beuls, Thoracic disc herniation and acute myelopathy: clinical presentation, neuro-imaging findings, surgical considerations and outcome, *J Neurosurg Spine* 2011; 14:520-528.
34. Back Pain: Upper, Middle, Right, Left, Sudden, Severe, Chronic [www.ehealthstar.com/ back-pain-upper-middle-causes-symptoms.php](http://www.ehealthstar.com/back-pain-upper-middle-causes-symptoms.php) (accessed on 24th Sept 2016).
35. Print this article -Bangladesh Journals Online [www.banglajol.info/index.php/BSMMUJ/article/download/28929/19321](http://www.banglajol.info/index.php/BSMMUJ/article/download/28929/19321) by MK Ahsan - 2016 (accessed on 21st Sept 2016).
36. Vol-15(2) 2014 JBSM. pmd -Bangladesh Journals Online [www.banglajol.info/index.php/JOM/ article/download/20685/14264](http://www.banglajol.info/index.php/JOM/article/download/20685/14264) (viewed on 18th Sept 2016).
37. Prevalence and distribution of intervertebral disc degeneration over [www.sciencedirect.com/ science/article/pii/S1063458413010029](http://www.sciencedirect.com/science/article/pii/S1063458413010029) Science Direct by M Teraguchi - 2014 (accessed on 21st Sept 2016).
38. Wood KB, Garvey TA, Gundry C, Heithoff KB. Magnetic resonance imaging of the thoracic spine. *J Bone Joint Surg (American)* 1995; 77A:1631-1638.
39. Hasan SA, Rahim MA. Study of Spectrum of Rheumatic Diseases in the Department of Physical Medicine and Rehabilitation, Chittagong Medical College Hospital, Bangladesh. *JCMCTA* 2009; 20(1): 6-11.
40. Global Prevalence of Ankylosing Spondylitis – [edscapewww.medscape.com/viewarticle/823006](http://edscapewww.medscape.com/viewarticle/823006) (accessed on 21st Sept 2016).
41. Dharmalingam M. Tuberculosis of the spine-Sabah experience. *Epidemiology, treatment and results, Tuberculosis* 2004; 84:24-28.
42. Evaluation and Management of Vertebral Compression Fractures – NCBI [www.ncbi.nlm.nih.gov/.../PMC35239](http://www.ncbi.nlm.nih.gov/.../PMC35239). (Accessed on 22nd Sept 2016).
43. Overview of hyperkyphosis in older persons – UpToDate [www.uptodate.com/contents/overview-of-hyperkyphosis-in-older-persons](http://www.uptodate.com/contents/overview-of-hyperkyphosis-in-older-persons).(Accessed on 24th Sept 2016).