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Original Research Article

Assessment of myofascial pain syndrome among married female healthcare workers: a cross sectional comparative study in a tertiary care centre

James C. George*, Subin Babu, Deny Mathew, Rejul K. Raj, Henry Z. Kurian, Koshy Abraham, Kevin Joseph, Rahul George Eapen, George Saju

Department of Orthopaedics, Believers Church Medical College, Thiruvalla, Kerala, India

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***Correspondence:**
Dr. James C. George,
E-mail: drjamescgeorge@gmail.com,

ABSTRACT

Background: Myofascial pain syndrome (MPS) is common among females between ages 20-40 years. Psychosomatic and mechanical reasons are attributed as causative factors. Female health care workers (FHW) in hospitals with rapid patient turn over are vulnerable to develop MPS. Our aim was to ascertain the prevalence of MPS in married FHW working in various departments of the hospital and its association with poor sleep and work stress.
Methods: We selected married FHWs in 20-50 years age group and divided them into two groups, medical and paramedical (those involved directly and indirectly with patient care respectively). MPS was diagnosed after detailed personal interview and clinical examination. Sleep duration was divided into less than 5 hours and more than 5hours. Presence of work-related stress and other medical parameters were also recorded.
Results: A total of 150 medical and 150 paramedical FHWs were included in the study. Overall prevalence of MPS among FHWs was 42%, of which, medical group was 32% and paramedical was 52%. The paramedical group showed significantly higher prevalence of MPS (p: 0.02). Sleep was less than 5 hours in 29.3% of medical FHW and 13.3% of paramedical. This difference didn't show any association to MPS (p=0.8). 38% FHW perceived excessive work stress, 40% were paramedical and 36% were medical. This didn't correlate with prevalence of MPS (p=0.2) among them.
Conclusions: Paramedical FHW experienced more MPS than medical and it was more of mechanical type and not due to work stress or sleep deprivation.

Keywords: Myofascial pain dysfunction syndrome, Healthcare workers, Females

INTRODUCTION

Myofascial pain dysfunction syndrome (MPDS) is known as a psychophysiological disease, that is associated with muscular structure, specifically tempero-mandibular joint dysfunction.[1] Though MPDS is also termed myalgia, myofascitis, myogleosis, myofascial pain and fibromyalgia, myofascial pain is a specific syndrome caused by the presence of trigger points (Trps) within the muscles.[2] According to Svensson and Graven-Neilsen myofascial pain syndrome (MPS) is defined as a stress-related disorder.[3] It may also occur due to muscle overexertion, muscle over contraction or trauma in some cases.[4]

Medical colleges are hospitals who caters maximum number of patients by health care workers. National Accreditation Board for hospitals and labs (NABH and NABL) has provided quality standards for healthcare system. Such NABH and NABL accredited hospitals with more than 80% bed occupancy makes patient care better but at the expense of strict healthcare workers supervision

and documentation. Healthcare workers deliver care and services to sick and ailing either directly as doctors and nurses or indirectly as assistants, technicians, aides or medical waste handlers. Healthcare workers can be stressed because of increasing work load, long working hours, high clientele expectations, rapid expanding knowledge base, increasing government regulations, malpractice suits and hazards of workplace. Increasing documentation as a part of quality control and quality audits can also increase the stress on health workers. Female health workers need to take care of their family and children too during the remaining hours of the day. This can end up compromising their own personal health and well-being.

Our aim was to find out the prevalence of MPS in female married health care workers working in various departments of the hospital, and whether there is any association of MPS with sleep and work stress. Our hypothesis was female health workers directly involved in patient care has more MPS and associated sleep deprivation secondary to work stress.

METHODS

This was a cross sectional study conducted in Believers Church Medical College Hospital after obtaining clearance from the Institutional Ethics Committee. This is a NABH and NABL accredited medical college in central Kerala. This study was conducted among female healthcare workers who were married and were between the age group of 20-50 years. The study was conducted from June 2022 to September 2022.

The prevalence of MPS worldwide is 30% among females.[1,7,8]

$$Sample\ size = 4pq/d^2$$

In the above formula, p=30%, q=70%, absolute precision=6 and alpha error=5%, and the required sample size=250. So, rounding off to 300.

We randomly selected 300 female participants from the employee list that was generated from the human resource department.

We included all female health workers between the age group of 20-50 years who consented to participate in the study. We excluded people who were unmarried and who had to work more than 8 hours per day. We divided them into two groups: medical (those involved with patients directly like nurses and therapists) and paramedical (those involved indirectly with patients like pharmacists, and lab technicians).

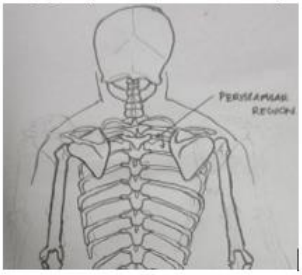
The information regarding myofascial pain was collected through personnel interview by reading out a questionnaire. The information regarding trigger point was identified in the periscapular area to confirm diagnosis of MPS. The questionnaire also contained questions regarding other medical conditions like arthritis, psychiatric disorders, seizures and also any kind of stress involved in the work (Figure 1).

Age:

Occupation:

(Tick appropriate answer)

1. Do you have periscapular pain Y/N
2. Trigger point (examined by doctor)



3. How many hours do you sleep per day
   (a) Less than 5 hours.
   (b) More than or equal to 5 hours
4. Are you on any medications for
   (a) Arthritis - Y/N
   (b) Psychiatric disorders - Y/N
   (c) Seizures - Y/N
   (d) Hypertension - Y/N
   (e) Diabetes Mellitus - Y/N
   (f) Thyroid disorders - Y/N
   (g) Vitamin D deficiency - Y/N.
5. Do you have any work stress - Y/N.
6. Do you have any altered menstrual cycles - Y/N
7. Do you have any numbness of hand - Y/N.
8. Did you get COVID in last 12 months - Y/N.

Figure 1: Interview questionnaire for female health care workers.

We wanted to know the prevalence of MPS among female married healthcare workers (FHW) and compare it among the two groups. We also assessed the sleeping hours and work stress among them and evaluated the association of these factors with regard to MPS. The sleep hours were divided into two (less than 5 hours and more than equal to 5 hours) for this purpose. Statistical analysis was done using Pearson Chi square test. There was no external funding involved in the study.

RESULTS

There were 1302 female healthcare workers in the hospital. Among them 1254 were between 20-50 years and 829 were married. There were 523 medical and 306

paramedical workers. Among them 300 gave consent for study (150 medical and 150 paramedical). We took samples from 25 departments of hospital. Among them 8 departments belonged to medical group and 17 departments belonged to the paramedical group (Figure 2). In the medical group majority were nurses (n=136) and in paramedical majority were lab technicians (n=76).

The age of female health care workers ranged from 21-50 years (mean=33.17%, SD=6.2). The medical group had an age group ranging from 22-48 (mean=33.93, SD=5.96) while the paramedical group had a range from 21-50 (mean=32.4, SD=6.474) (Table 3).

126 female health care workers had MPS (42%), 48 among them were in medical group and 78 were in paramedical group. The prevalence of MPS in medical and paramedical group was 32% and 52% respectively (Table 1). The paramedical group showed a significant prevalence of MPS compared to medical group (p=0.02).

Table 1: Prevalence of MPS in FHW.

Parameters	Number	Frequency (%)
FHW	126	42
Medical	48	32
Paramedical	78	52

Among FHW 21.3% had sleep less than 5 hours. In the medical group 29.3% had sleep less than 5 hours while it was only 13.3% for the paramedical group. This difference of sleep deprivation seen among the medical group compared to paramedical was significant (p=0.07), but it did not show any association with MPS (p=0.8) (Table 2).

Table 2: Frequency distribution of sleep deprivation (less than 5 hours).

Parameters	Number	Frequency (%)
FHW	64	21.3
Medical	44	29.3
Paramedical	20	13.3

114 female health workers (38%) were having work stress of which 40% were paramedical and 36% were medical (Table 5). The work stress seen among paramedical were not significant compared to medical group. The work stress did not show any positive association with prevalence of MPS (p=0.2).

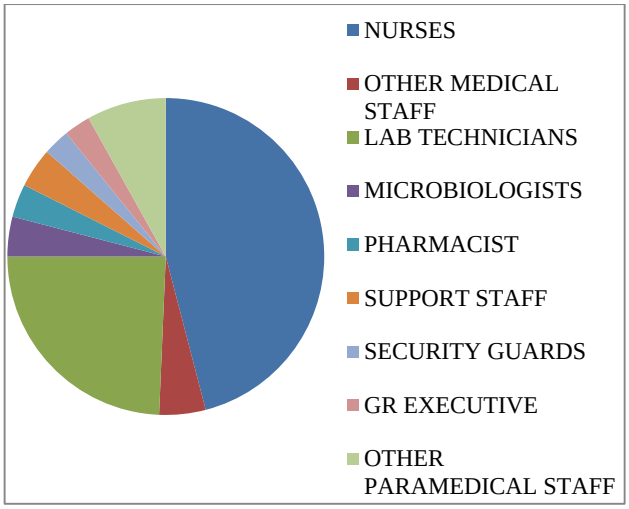


Figure 2: Distribution of female health care workers in the hospital.

Another factor which showed a major prevalence among female health workers was altered menstrual cycle, numbness of hand and vitamin D deficiency. The prevalence of these factors was 18.7%, 14.6% and 12% respectively. The altered menstrual cycle was more among paramedical while vitamin D deficiency and numbness of hands were more seen among medical group. None of these showed a positive association with MPS (Table 4).

The prevalence of various health issues was showed in Table 5.

Table 3: Demographic data of FHW.

FHW	Number	Mean age in years
Nurses	136	34
Other medical staff	14	33.7
Lab technicians	76	31.05
Microbiologists	12	29
Pharmacist	10	24
Support staff	12	36
Security guards	8	39
GR executive	8	32
Other paramedical staff	24	36

Table 4: Association of risk factors with MPS.

Number	Risk factors	MPS present (%)	MPS absent (%)	Pearson Chi square value (%)	P value
1	Arthritis	1.6	98.4	1.39	0.2
2	Diabetes mellitus	6.3	93.7	0.2	0.6
3	Hypertension	1.6	98.4	1.6	0.19
4	Hypothyroidism	1.6	98.4	1.39	0.2
5	Altered menstrual cycle	17.5	82.5	1.6	0.2

Continued.

Number	Risk factors	MPS present (%)	MPS absent (%)	Pearson Chi square value (%)	P value
6	Work stress	42.9	57.1	1.08	0.2
7	Vitamin D deficiency	7.9	92.1	0.8	0.3
8	Sleep less than 5 hours	43.5	56.5	0.05	0.8
9	Numbness of hand	12.7	87.3	0.2	0.6

Table 5: Frequency distribution of medical diseases in FHW.

Diseases	Number	FHW (%)	Medical (%)	Para medical (%)
Arthritis	2	0.7	0	1.3
Psychiatric illness	2	0.7	0	1.3
Seizure	0	0	0	0
Diabetes	16	5.3	4	6.7
Hypertension	12	4	2.7	5.3
Hypothyroidism	2	0.7	O	1.3
Altered menstrual cycle	40	13.3	8	18.7
Work stress	114	38	36	40
Vitamin D deficiency	32	10.7	12	9.3
COVID in last 1 year	122	40.7	38.7	42
Numbness in hand	34	11.3	14.6	8

DISCUSSION

MPS appears with muscular pain and other symptoms with a 30% occurrence, thus leading to considerable disability and inability to work.[6-8] It has been reported that, in the American population, approximately 44 million people have myofascial pain-associated problems.[9] A statement from specialized clinics for head and neck pain says that 55% of cases are nearly related to myofascial etiology, while 95% of cases have myofascial pain.[10] A Danish researcher reported the existence of myofascial pain in 37% of men and 65% of women within a randomly selected population (n=1504) aged between 30 and 60 years.[11] The myofascial pain management Centre at the University of Miami School of Medicine conducted a study in an American population (n=238) and reported that 85%of the cases presented mainly with MPS.[12] Another study stated that 74% of the patients had pain due to a primary cause (such as mechanical cause), while 93% complained of pain during the diagnosis. The data indicate that a high proportion of patients are unaware of their disease, with 74% of patients attending the clinic with pain that is supposed to be caused by either mechanical injury or trauma.[13] Another study reported that females tend to experience a higher recurrence rate of MPS than males, with the male: female proportion ranging from 3:1 to 5:1 in various reports.[14] The age group showing highest incidence was the 20-to-40-year age group.[15]

The origin of TrPs in MPS is still unknown, although remarkable progress has been made in identification of the features of TrPs.[16] Precipitating factors of MPS like nerve root compression and degenerative causes have been hypothesized to lead to the discharge of acetylcholine at motor end plates, which causes muscle fibre contractions.[17] The release of vascular and neuroactive substances cause ischemia locally and increases muscle pain. Prolonged acetylcholine discharge can lead to muscle pain and spasm. Local muscle fibrosis may occur in the later stages. The myofascial trigger point (MTrp) contains a neurovascular bundle that consists of motor nerve endings and groups III and IV nociceptive sensory afferent nerve endings.[18]

Patient counselling regarding the disease is very important in treating MPS. It is often difficult for the patients to accept a psychophysiological side of the disease. Normally, injection is the first treatment approach in the treatment of MPS to relieve the pain. An injection using dry needling and lidocaine anaesthetic solution injection can be helpful in MPS treatment. In 2010, Ay et al reported that using dry needling and lidocaine injection with stretching exercises were beneficial in treating MPS.[19,20] Besides, botulinum toxin injection has been reported to produce remarkable effects such as sudden pain reduction, especially when a saline injection was not effective.[21] Moreover, Gazi et al compared that analgesic result of acupuncture (which is supposed to help restore blood circulation) to TrPs injections (containing 0.25% bupivacaine administered twice weekly) with cyclobenzaprine chlorhydrate and sodium dipyrone on trigger points to prevent the recurrence of MPS symptoms. The results showed comparable pain liberation and progress in the time period of 4 weeks.[22] Additionally, therapeutic ultrasound is a new treatment strategy for MPS. Being a non-invasive procedure, it is valuable in the treatment of deeper muscle. Manual therapeutic techniques are not sufficient for the assessment of deep muscle.[23]

In the case of a misdiagnosis, chronic pain syndrome and complex behavioural problems may result, leading to psychosocial problems. Most of the time, chronic pain may cause sleep disturbance where patients have trouble finding a comfortable sleeping position. Sometimes, posture changes during sleep affect the disease, thus affecting the patients; and their sleep throughout the night.[7]

Female health care workers have eight hours work with 3 shifts in 24 hours. Usually, the working hours end up more than eight hours while handing over to the next team. Similarly, they have to travel back home to take care of their family and kids. Such schedule of work involving several quality checks, travel and family ends up with altered sleep cycle and stress for female workers especially those married and of child bearing age. Therefore, these female health workers are vulnerable for myofascial pain syndrome and sleep disturbances which was also shown by Drewes and Jennum.[11]

Quality accreditation standards of clinical and paramedical areas (NABH and NABL) has increased the standards of healthcare delivery. This in fact requires a great effort from the healthcare workers (both medical and paramedical) for maintenance of quality standards.

Since the work pattern and related stress is different for people who are directly dealing with patients and those indirectly (paramedics) the prevalence of MPS and sleep deprivation should be different. In a tertiary care centre with good bed occupancy ratio these problems should be more evident. The paramedical group and medical group displayed similar work stress (40% and 36% respectively) but it showed a negative association with MPS (p=0.2).

It was clearly seen in our study that 42% of FHW has MPS and 21.3% has sleep deprivation. But contrary to the expectation that people directly dealing with patients should have more stress and therefore more MPS, we found that it was the paramedical group who doesn't directly deal with patients had more MPS compared to medical group (p=0.02). Though sleep deprivation is a common cause and symptom of MPS our study didn't show any association between these two (p=0.8). While the medical group had significantly more sleep deprivation than paramedical group (p=0.07) and it didn't turn out as MPS for them.

Majority of paramedical group were lab technicians, pharmacists and microbiologists. The paramedical group has to use equipments and computer more frequently than the medical group. The neck posture, muscle usage and work stress must have resulted in increased MPS among them. This pattern was similar to the mechanical cause suggested by Gerwin.[13]

Sleep disturbances are one of the most common effects of myofascial pain syndrome.[5] In our study paramedical group did not show much sleep disturbance compared to medical group but had more MPS compared to medical group. Therefore, the sleep deprivation seen among medical group may be due to reasons other than MPS. The work stress experienced by both the groups also didn't show any significant difference (p=0.7).

We can see that more paramedical workers got COVID than medical workers who work in close contact with patients. This difference was not very significant (p=0.7). This may be due to better organized work pattern, better knowledge about the disease and lesser medical diseases seen among the medical group. Similarly, even though Vitamin D deficiency was more seen among medical group (p=0.7) it didn't translate into MPS among them. Altered menstrual cycles were significantly more among paramedics (p=0.09) compared to medics even though the mean age of both the groups were the same. But it did not show any association to MPS (p=0.2).

Limitations

Majority of the samples consisted of nurses and technical staff who may not be representative of the medical community. Doctors and other medical staff who work more than 8 hours per day is excluded from the study, which may contribute to a higher prevalence of MPS, if they were included.

CONCLUSION

From our study we found that paramedical female healthcare workers suffer more MPS compared to medical group. There were no significant differences between the two, regarding chronic health issues and work stress resulting in MPS. None of these factors showed a positive correlation to MPS. Even the sleep hours seem to be better with the paramedical group. Therefore, we like to conclude that the MPS seen in paramedical group is more of a mechanical type and they require more training regarding muscle strengthening and posture correction.

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