

# The Prevalence of Musculoskeletal Pain and Forward Head Posture among Heroin Users during their Withdrawal with Methadone

Fahimeh Kamali-Sarvestani PhD<sup>1</sup>, Tahereh Motiallah MSc<sup>2</sup>, Farahnaz Ghaffarinejad MSc<sup>3</sup>

## Original Article

### Abstract

**Background:** Heroin is an extremely addictive narcotic drug derived from morphine. Its continued use requires increased amounts of the drug to achieve the same effect, resulting in tolerance and addiction. This study was done in order to determine the prevalence of musculoskeletal pain and forward head posture among heroin users during their withdrawal.

**Methods:** This research was a cross-sectional study that was done on 90 heroin users (83 males, 7 females) aged between 20 to 40 years ( $32.5 \pm 3.81$ ) during their withdrawal in Shiraz, Iran. They were selected by simple randomized sampling. Data were collected by a form regarding age, sex, the duration of heroin use, and musculoskeletal pain. Pain was measured by VAS (visual analog scale) and forward head posture was evaluated by plumb line. Pearson correlation technique and chi-square were used for analyzing the data.

**Findings:** The results revealed that the majority of heroin users suffered from musculoskeletal pain during their withdrawal. At the end of withdrawal 53.4% had severe pain, 38.8% had moderate pain, and 7.8% of them had mild pain. Pain in the lower extremities and low back was more common than the upper extremities. The intensity of pain before withdrawal was mild, during withdrawal was moderate, and at the end was severe, but there was no significant correlation between them. The results also showed 43.3% of subjects had normal posture and 56.7% had forward posture.

**Conclusion:** According to the results, the intensity of pain increased during the withdrawal period; therefore, more attention must be paid to this complication in heroin users for better evaluation and a successful withdrawal.

**Keywords:** Addiction, Heroin, Withdrawal, Musculoskeletal pain, Forward head posture

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1- Associate Professor, Department of Physiotherapy, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran  
2- Lecturer, Department of Physiotherapy, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran  
3- PhD Student, Department of Physiotherapy, School of Rehabilitation Sciences, Shiraz University of Medical Sciences, Shiraz, Iran  
Correspondence to: Tahereh Motiallah MSc, Email: motiallah@sums.ac.ir

## Introduction

Heroin, with the chemical name "diacetylmorphine", is one of the most important derivatives of morphine. This drug was provided as a mean for effective treatment of addiction to morphine for the first time in 1900, but experience showed that a daily intake of 60 mg for 2 weeks results in addicted. This substance can be used by smoking and injection, and because of its intense addictiveness has been placed in the controlled drug list since 1970.<sup>1</sup> Long term use of this drug can have destructive effects, including the closure of veins, infection of the heart valves, abscess, cellulitis, liver problems, and pulmonary problems, such as pneumonia and tuberculosis. Lack of use or failure to reach this substance for an addicted person symptom, such as shivering, irritability, bradycardia, and irregular body temperature, severe cramps in the stomach and intestines, and insomnia, which are called withdrawal syndrome.<sup>2</sup>

Methadone is a synthetic opioid the consumption of which became prevalent in Germany after World War II, in 1960.<sup>3</sup> This substance is used for withdrawal. The effect appears in 30 minutes after consumption and the effect of the drug remains in the body for 24 to 36 hours.<sup>3</sup> The constant dosage of methadone can be maintained for several years without need to increase its consumption.<sup>4</sup> Pain in the spine and extremities are the most common pains experienced by addicts during withdrawal and is one of the major problems during their treatment. The study by Darnall et al. in the United States showed that women are more at risk of suffering long term and different types of pain than men, and the long term use of drugs exposed them, more than men, to problems such as endocrine disorders, heart problems, infertility, and etcetera. The results showed that infants of these women are also at risk.<sup>5</sup> Boscarino et al. showed that long term use of analgesics in reducing pain develops dependence in patients. They interviewed 705 patients and found that 36% of them after 12 years of using analgesics were completely dependent.<sup>6</sup>

Rosenblum et al. reported on the prevalence of pain in 390 methadone addicts during withdrawal. Results showed that about 2/3 of these people experienced very severe pain which had major impacts on their physical and mental

activities, and about 1/3 of them, by using alcohol or illicit drugs, would reduce their pain. Moreover, a relatively large number of them received additional pain medications by doctors. Basically, the main reason for these people to use drugs was pain.<sup>7</sup> Although other studies confirmed the results of Rosenblum et al.,<sup>7</sup> other studies performed in the same year showed that, first, methadone decreased sensitivity to pain, and second, while receiving this drug, the addict learns that methadone can be a simpler, cheaper, and easier method to reduce pain than drugs.<sup>8</sup>

Another group in Canada led by Brands et al. conducted a study on 178 addicts during withdrawal for 2 years. They found that 83% of these individuals for reducing their pain used more opium than prescribed, and several of them have been associated with heroin. They divided these people, in terms of drug consumption, into 4 groups and found that only 24% used opium, 17% heroin, 24% at first used opium and then heroin, and 35% at first used heroin and then opium. The results showed those older addicts and those who were heroin addicts experienced more chronic pain during withdrawal and the existence of these pains were viewed as one reason for leaving the treatment period. Therefore, to complete the course of treatment, 61% of these people needed psychiatric treatment.<sup>9</sup> Apart from the pain that was a major problem for the addicts, poor posture, especially in head and neck, was also observed in these groups, and this matter can increase the pain in neck and spine. Given the above information and other findings regarding the prevalence of spinal and extremity pain of the addicts and its impact on the strong dependence of the individuals on drugs and their resistance against withdrawal, having a clear scientific view of the incidence of these complications in the addicts' society can help in designing prevention programs or treatment programs.

## Methods

This was a cross-sectional study. It was conducted on the prevalence of pain in 90 heroin addicts (based on a diagnosis of DSM IV), who self-referred to Fars province Welfare Organization in Shiraz, Iran, and were on methadone during withdrawal. Simple random sampling was done. People with postural abnormalities, such as spinal deviation or leg

length discrepancy, or those with previous history of surgery on their spine or limb were excluded from the study. For the greater accuracy of the study, posture assessment was done by one examiner. Data was collected by a form including information about age, gender, approximate length of addiction, musculoskeletal pain and its severity, and also by examining their posture, forward head posture during the 4 weeks of treatment.

In order for the addict to indicate the place of pain a schematic illustration of a human body in anatomical form was included in the questionnaire. To assess pain intensity, two methods to evaluate the quality of pain and a visual scale visual analog scale (VAS) were used. In the first method the pain intensity was based on a three-point scale in the range of minor discomfort and occasionally without hindering heavy duty (grade 1), moderate pain and preventing heavy duty (grade 2), and severe pain and disturbing daily activities (grade 3). In the second method pain was based on a range of 0 to 10, little pain was considered in the range from 0 to 3, moderate pain 3 to 7, and severe pain was graded from 7 to 10.

Assessment of forward head and shoulder disorders was based on Kendall standard method assessed by using plumb line.<sup>10</sup> The person would stand in a 25 cm distance from the plumb which was hanging from the ceiling. Then, the researcher, from the side view and using a meter, measured the following areas: based on Kendall definition in a normal posture from the side view the vertical line of the plumb line should pass through the earlobe, seventh cervical vertebrae, acromion appendage, greater trochanter of the femur, further along the midline of the knee joint, and a little further away from the outer ankle. The severity of the mentioned disorder according to the earlobe compared to the plumb line from the side view was divided into three grades:

1. If the center of the earlobe was on the plumb line or 1 cm ahead of it the person was without the disorder and considered normal.

2. If the posterior margin of the earlobe was placed on the plumb line the abnormality was considered moderate.

3. If the posterior margin of the earlobe was 1cm a head of the plumb line the abnormality was considered severe.

Data analysis was performed using SPSS for

Windows (version 18; SPSS Inc., Chicago, IL, USA), and chi-square test and Pearson's correlation coefficient were also used.

## Results

The results showed that the majority of the subjects (42.1%) were in the age group of 21-30 years, and 36.6% were in the age group of 31-40 years. In other words, 78.0% of the addicts were in the age group of 20-40 years. 92.2% of them were male and 7.8% were female. In evaluating the approximate duration of addiction it was found that 53.3% of the people (the largest group) had been addicts for 5 to 10 years, 21.1% for less than 5 years, and 12.2% that were the smallest group for 10 to 15 years.

Regarding the number of times of withdrawal, in 16.7% of the subjects this was their first time of withdrawal, and 83.3% of them had at least once tried to withdraw before the study but were not successful. In studying musculoskeletal pain, it was found that these people suffer from pain in different parts of their body. Table 1 shows the distribution of the location of pain in patients.

**Table 1.** Distribution of the pain area in the addicts

Pain location	Frequency	Percentage
Back	89	65.5
Cuff	51	57.7
Ankle	46	51.1
Foot	40	44.0
Groin	32	35.5
Thigh	27	30.0
Arm	22	24.4
Hand and wrist	19	21.1
Neck	18	20.0
Abdomen	18	20.0
Shoulder	12	13.3
Chest	12	13.3
Gluteal	8	8.8
Facial	3	3.3

According to table 1, the majority of the subjects suffered from back pain, cuff muscle pain, and abdominal pain (65.5%, 57.7% and 20.0% respectively), and ankle, groin, and neck pain were observed in a smaller percentage of subjects. Finally, the lowest rate of subjects suffered from gluteal region and facial pain. Pearson correlation coefficient showed a significant negative correlation between using drugs and the location of the pain ( $\alpha < 0.05$ ) ( $P = 15\%$ ,  $r = 26\%$ ). This

finding clearly indicates that the more the addicts use the drug, the less pain they feel in different parts of their bodies.

As shown in table 2 the majority of patients (48.9%) expressed to have little pain before the treatment. This was because of using drugs and gaining pain relief by it. However, in the last sessions of treatment the majority of the subjects (53.4%) expressed to have high intensity pain. The correlation coefficient between using drugs and pain intensity in different stages of the treatment showed that there was no significant relationship between these two variables. Therefore, the data revealed that the ratio between using drugs and pain intensity in the first sessions of treatment was  $r = 0.07$  and  $P = 0.48$ , and in the middle sessions it was  $r = -0.19$  and  $P = 0.06$ , and in the last sessions of treatment it was  $r = 0.07$  and  $P = 0.46$ .

One of the other aims of this study was evaluating the amount of head and neck forward posture among the addicts and determining its relationship with the duration of drug use. 43.3% of the participants (39 persons) had normal status and the rest (56.7%) had moderate (36.7%, 33 persons) or severe (20.0%, 18 persons) head and shoulder forward posture. Moreover, the coefficient correlation between the duration of drug use and head and shoulder forward posture was  $P = 0.48$  and  $r = 0.13$ , which was not statistically significant.

## Discussion

In this study, which aimed to investigate the prevalence of musculoskeletal pain among addicts during withdrawal with methadone, 24.5% of the 90 addicted subjects had severe pain before the study, and this amount was increased to 53.4% in the last sessions of withdrawal. The comparison of the estimated prevalence of pain among drug users in previous similar studies demonstrates a higher prevalence of pain in this

study.<sup>6,7,9</sup> Rosenblum et al. reported the prevalence of musculoskeletal pain in addicted persons during withdrawal as 38.7%.<sup>7</sup> In the study by Brands et al. this amount was estimated as 40.2%. Perhaps the difference was due to differences in race, culture, and lifestyle of the study population, and the different thresholds of pain. On the other hand, all studies stated that the high prevalence of pain during withdrawal was one of the factors causing the addicts to avoid completing the treatment. This result is fully consistent with the present results.<sup>6,7,9</sup> On the other hand, Rosenblum et al. also reported prevalence of severe pain in 2/3 of the addicts which is consistent with the present results.<sup>7</sup> The findings of another study showed no significant correlation between drug use and pain intensity at different stages of treatment. Despite the fact that pain intensity in the final stages of treatment was higher compared to the early stages, the coefficient correlation showed no significant relationship among them. These results were consistent with the results of the study by Brands et al.<sup>9</sup>

Another finding of this study was the high prevalence of pain in the waist medial side of leg which was consistent with the study of Rosenblum et al.<sup>7</sup> The researchers claimed the high prevalence of pain in these areas are due to many free nerve endings and subsequently report more pain in these areas due to the decrease in the body's natural endorphins during withdrawal.<sup>6,7</sup> Other variables examined in this study were head and shoulders forward posture. The results revealed that 56.7% of addicts had poor to moderate or severe posture. Although the incidence of head and shoulders forward posture in the study by Cho in 15-19 year olds was reported to be 25.0% and 37.0% respectively.<sup>11</sup> However, Morris reported this amount as 66.0% in 20-35 year olds.<sup>12</sup> In his study 16.0% of people suffered from severe head and shoulder forward

**Table 2.** Pain intensity distribution in the subjects before treatment, initial sessions, and middle and the end of the therapy sessions

Sessions Intensity	Before the treatment		Initial sessions		Middle sessions		Final sessions	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Little	44	48.9	24	26.7	12	13.3	7	7.8
Moderate	24	26.6	37	41.1	61	67.8	35	38.8
Severe	22	24.5	29	32.2	17	18.9	48	53.4
Total	90	100	90	100	90	100	90	100

posture; this was less than the percentage of the posture in the present study.<sup>12</sup> However, in total, the percentage of head and shoulder forward posture in addicts does not have a significant difference with the normal population. However, it was found that there was a direct relationship between pain in head, neck, and shoulder, and the intensity of forward head and shoulder posture. However, in people with forward head and shoulder posture, pain was not necessarily observed. Therefore, it cannot be assumed that the pain in head and shoulder of the addicts is affected by the forward head and shoulder posture. Pain in these areas is probably due to the effects of withdrawal, and compared with back pain and leg pain (65.0% and 57.7%) accounted for a smaller percentage (20.0% and 13.0%). There was no relation between the duration of drug use and forward head and shoulder posture. Further researches are needed to assess the influence of addiction on person's posture.

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## Conclusion

The findings showed that forward head and shoulder posture of the addicts had no significant difference with the normal population. There was a high prevalence of musculoskeletal pain in addicts during withdrawal. In many cases, this pain caused withdrawal of the treatment period and not completing the duration of the treatment by the addict. The authorities' attention to these matters seems to be necessary.

## Conflict of Interests

The Authors have no conflict of interest.

## Acknowledgements

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## شیوع دردهای اسکلتی - عضلانی و جلوآمدگی سر و شانه در معتادان به هروئین حین ترک با متادون

دکتر فهیمه کمالی سروستانی<sup>۱</sup>، طاهره مطیع‌اله<sup>۲</sup>، فرحناز غفاری‌نژاد<sup>۳</sup>

### مقاله پژوهشی

### چکیده

**مقدمه:** هروئین یکی از مهم‌ترین مواد مخدر و مشتقی از مورفین می‌باشد. مصرف مداوم این ماده باعث می‌شود که فرد برای رسیدن به همان اثر قبلی میزان ماده را به طور دائم افزایش دهد و در نتیجه اعتیاد حاصل می‌گردد. این تحقیق به منظور بررسی شیوع دردهای اسکلتی-عضلانی و همچنین جلوآمدگی سر و شانه در معتادان حین ترک طراحی شد.

**روش‌ها:** مطالعه مقطعی حاضر بر روی ۹۰ معتاد به هروئین حین ترک با داروی متادون در محدوده سنی ۲۰-۴۰ سال (میانگین ۳۲/۵ ± ۳/۸۱ سال) در شهر شیراز و به روش نمونه‌گیری تصادفی آسان انجام گردید. داده‌ها به وسیله فرمی که حاوی اطلاعاتی مانند سن، جنس، مدت زمان تقریبی ترک اعتیاد و وجود دردهای اسکلتی-عضلانی بود، جمع‌آوری شد. ارزیابی شدت درد با استفاده از مقیاس سنجش چشمی (VAS یا Visual analog scale) و بررسی جلوآمدگی سر و شانه هم به وسیله خط شاقولی مورد بررسی قرار گرفت. جهت تحلیل داده‌ها از آزمون‌های آماری  $\chi^2$  و ضریب همبستگی Pearson استفاده گردید.

**یافته‌ها:** تعداد زیادی از معتادان حین ترک از دردهای اسکلتی-عضلانی رنج می‌بردند؛ به طوری که در انتهای دوره درمان ۵۳/۴ درصد از آن‌ها درد شدید، ۳۸/۸ درصد درد متوسط و ۷/۸ درصد درد خفیف را گزارش کردند. به طور کل، درد در اندام تحتانی و کمر بیش از اندام فوقانی گزارش شد. شدت درد در اوایل درمان خفیف، در اواسط درمان متوسط و در اواخر درمان شدید بود، ولی از لحاظ آماری اختلاف معنی‌داری بین آن‌ها مشاهده نشد. همچنین ۴۳/۳ درصد از معتادان دارای وضعیت طبیعی و ۵۶/۷ درصد دارای جلوآمدگی سر و شانه بودند که از نظر آماری اختلاف معنی‌داری بین آن‌ها وجود نداشت.

**نتیجه‌گیری:** جلوآمدگی سر و شانه در معتادان تفاوت قابل ملاحظه‌ای با جمعیت طبیعی ندارد. شیوع دردهای اسکلتی-عضلانی در معتادان حین ترک بالا می‌باشد و در بسیاری از موارد وجود همین دردها باعث ترک دوره درمان و عدم تکمیل آن توسط فرد معتاد می‌شود که توجه به این مسأله توسط مسؤولین امری ضروری به نظر می‌رسد.

**واژگان کلیدی:** اعتیاد، هروئین، ترک، دردهای اسکلتی-عضلانی، جلوآمدگی سر و شانه

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Email: motiallah@sums.ac.ir

نویسنده مسؤول: طاهره مطیع‌اله