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Effects of COVID-19 Quarantine on patients affect of hip osteoarthritis in list for joint replacement

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Abstract

Background: The emergency caused by COVID-19 Pandemia has resulted in a complete suspension and consequent delay of common planned surgery such total hip replacement in patients affect by osteoarthritis. At the same time, the issue of the quarantine imposed changes to the normal lifestyle of these patients. The purpose of our study is to evaluate how the presence of these two factors affect the quality of live of patients living in the Italian red zone. **Methods:** From outpatient pre-operative assessment we collect data about: demographic data, WOMAC score, NRS (Numeric rating scale 0-10), PCS SF12 and MCS SF12 score. Selected patients were therefore contacted by telephone call and re-assess using the same score. In addition, patients were asked if they intended to undergo the planned surgery again despite the current emergency. **Results:** 14 patient have been recruited for the study. Male/female ration was 10/4, mean age was 70 years. Pre operative outpatient assessment mean WOMAC score was 44,86 (SD ± 8,52), mean NRS was 8,07 (SD ± 1,33), PCS SF12 was 30,33 (SD ± 5,0) and MCS SF12 was 40,95 (SD ± 3,51). At re-evaluation the mean WOMAC score was 32,86 (SD ± 17,88), mean NRS was 5,79 (SD ± 3,66), PCS SF12 was 39,9 (SD ± 3,70) and MCS SF12 was 50,14 (SD ± 6,86). **Conclusion:** The exceptionale pandemic from Covid-19 has profoundly changed our lifestyle, impacting normal daily activities but also on regular surgical activity in patients affected by osteoarthritis. Our study suggested that the lifestyle changes imposed by the situation led to an improvement of clinical score. This shows how an exceptional event can affect many aspects of daily life.

Keywords: Hip arthroplasty, Clinical outcome, COVID-19, Quarantine, Hip replacement, Pre-operative planning.

INTRODUCTION

The COVID-19 pandemia posed a huge challenge for Italian nationals' healthcare system [1]. Especially in Lombardy region where have been reported 80.089 case among 215.858 cases registered in Italy on 6 may 2020[2]. To deal with this heavy burden, the health authorities had to redistribute the resources of nursing staff, medical staff and hospital facilities to account this exceptional emergency [3, 4]. On this situation, National authorities have also issued a "quarantine" decree to reduce the spread of the virus from 9 march 2020 to create a National "red zone" [5]. This measure has greatly changed the lifestyle of citizens but its result efficacy in limiting the spread of the virus [6]. This decree, for reasons of public health, has severely limited the possibilities for citizens to move and frequent public places limiting only to states of need [7]. This reduction has led many people to profoundly change their daily lives.

In this situation, many departments not strictly related to the management of infectious diseases, such as our orthopedics and traumatology department, had to greatly reduce their normal daily activities to transfer both medical and nursing staff to emergency management.

The situation has led to a complete suspension of elective surgical activities including joint replacement surgery especially of knee and hip.

Total hip replacement (THR) is undertaken to relieve pain and improve function in individuals with advanced arthritis of the hip joint [8]. Represent one of the mayor part of orthopedic elective surgery in Italy and in the world with number in growing [9, 10]. According to literature these surgery is reserved for patients suffering from severe degrees of coxarthrosis who have a history of conservative treatment failure with associated reduction in quality of life [11]. Its represent a definitive intervention to improve lifestyle of these patient and often conduct to a great satisfaction and very favorable outcome[12].

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The emergency caused by COVID-19 has resulted in a complete suspension and consequent delay of this type of surgery in these patients. At the same time, the issue of the quarantine imposed changes to the normal lifestyle. The purpose of our study is to evaluate how the presence of these two factors affect the daily activities in patient in list for total hip replacement surgery delayed for COVID-19 pandemia.

METHODS

From database of our hospital we selected patients who had made an outpatient pre-operative assessment for total hip replacement surgery before quarantine issue and then planned surgery postponed due COVID-19 emergency. In our department, pre-operative assessment are usually carried out from 1 to 2 months before planned surgery. Our unit setup consists of an orthopedic and a multidisciplinary anaesthesiologist-led assessment as recommended in literature [13]. In the orthopedic examination we collect pathological history, physiological history with assessment of quality of life, social history, imaging necessary for surgical planning, clinical examination, identification of potentially modifiable risk factor and consequent patient information and education for surgery [14]. We use generic instrument for the assessment of quality of life. The Short Form 12 (SF-12) scale is a validated questionnaire assessing health-related quality of life, developed in the USA from the original SF-36 [15]. It measure different dimensions such as physical function, role limitations due to physical health problems, pain, general health, vitality (fatigue/energy), social function, role limitations due to emotional problems and mental health. The physical dimensions can be summarized into the physical component summary (PCS), while the mental component summary (MCS) is obtained from others dimensions. It is a self-administrated 12-item questionnaire, Scoring ranges from 0 to 100 points, with higher scores representing better health.

Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) is a greatly used in literature score to assess pain, function, and stiffness of the lower limb [16]. The WOMAC includes 24 items covering 3 domains: pain, stiffness, and physical function, and captures the level of each domain with 5 response categories using an ordinal scale. Lower values in the traditional scoring method (ranging from 0 to 96) reflect a better health status. We also use the Numeric Rating Scale from 0 to 10 to assess pre operative pain perception [17].

We select 14 patients eligible for study. Inclusion criteria were: complete pre-operative assessment for THR with admission for surgery during pre-quarantine time, absence of any COVID-19 infection related symptoms or exams during the observed period, absence of any significant clinical variation during observed period, planned surgery delayed for quarantine issue in COVID-19 emergency and complete adherence to authority disposition for quarantine.

From outpatient pre-operative assessment we collect data about: demographic data, WOMAC score, NRS (Numeric rating scale from 0 to 10), PCS SF-12 and MCS SF12 score [15 - 17]. Selected patients were therefore contacted telephonically and with a email self-administered questionnaire to avoid having to go to outpatient clinic for assessment and expose them to the risk of contagion. They were evaluated using WOMAC score, NRS, PCS SF12 and MCS SF12 score. In addition, patients were asked if they intended to undergo the planned surgery again despite the current emergency. The telephonic reevaluation was carried out on May 7, 2020. On this date, the restrictions imposed by the ministerial decree of 9 March 2020 were reduced by the decree of 4 May 2020 but limitations remain throughout the national territory and 55 days have passed since the establishment of the quarantine.

RESULTS

We select 14 patients eligible for the study, all data have been anonymized and telematic informed consent for the study have been

collected for every participants. There were 10 male patients and 4 female, mean age was $70,1 \pm 7.7$ standard deviation (SD) (Table 1). All patient indication for THR is primary osteoarthritis. At pre operative outpatient assessment the mean WOMAC score was $44,86 (SD \pm 8,52)$, mean NRS was $8,07 (SD \pm 1,33)$, PCS SF12 was $30,33 (SD \pm 5,0)$ and MCS SF12 was $40,95 (SD \pm 3,51)$. At control the mean WOMAC score was $32,86 (SD \pm 17,88)$, mean NRS was $5,79 (SD \pm 3,66)$, PCS SF12 was $39,9 (SD \pm 3,70)$ and MCS SF12 was $50,14 (SD \pm 6,86)$ (Table 2). The two group of data are compare using T-student test and all P-value are < 0.05 .

When asked, only 2 patients would prefer to postpone the surgery the other 12 patients they could accept the proposed surgery if it had been at the time of the follow-up. All patient referred complete adherence to quarantine disposition.

Table 1: Demographic and clinical data

Sex	Number (n)	Percentile (%)
Male	10	71
Female	4	29
Age		
Mean (yy)	Range	Standard deviation
70,1	55 - 80	7.7

Table 2: Clinical outcome

	Pre COVID QUARANTINE (mean \pm standard deviation)	Post COVID-19 QUARANTINE (mean \pm standard deviation)	P-VALUE
WOMAC Score	$44,86 \pm 8,52$	$32,86 \pm 17,88$	0,04
NRS	$8,07 \pm 1,33$	$5,79 \pm 3,66$	0,02
PCS SF12	$30,33 \pm 5,0$	$39,9 \pm 3,70$	$<0,05$
MCS SF12	$40,95 \pm 3,51$	$50,14 \pm 6,86$	$<0,05$

DISCUSSION

The COVID-19 crisis has profoundly changed the lifestyle of population and hospital activities in the most affected localities [1-6]. The normal activity of the orthopedics departments linked to elective surgery, especially total joint replacement surgery, has been suspended. This situation led to a delay in the treatment of patients affect of osteoarthritis. Patients who have indication for total hip replacement have normally a low quality of life due osteoarthritis limitation in joint function [18].

Our study report data comparable with data present in literature on preoperative WOMAC score [19]. Even on NRS and SF-12 mean score are comparable to other study presents in literature [20, 21]. This confirm that our data represent a normal finding in population that is going to undergone in hip arthroplasty surgery. In a 2019 study Nguyen et al. find a pre hip arthroplasty WOMAC pain score of 44.2, a MSC mean value of 44.7 and a 1-years post THR a value of 38.1 and 47.5 respectively [20]. Obviously, our data are hardly comparable with data collected normal situation but we observe an improvement of the score used to evaluate this patients during post quarantine follow-up (Table 2). We observe a WOMAC score of 32,86 a value similar to data reported on patient after hip arthroplasty [21]. Paradoxically seems the quarantine have a beneficial effect on hip osteoarthritis pain and joint function even comparable or better to arthroplasty or pharmacological and physical therapies in a short observation [22 - 25]. However we note

that only 2 patients will postponed surgery, this seems to suggest that patients still feel the need to undergo surgery.

Our hypothesis is that the exceptionally misure issue to control the COVID-19 pandemia have a strong influence on daily lifestyle of these patients. The reduction of normal daily activity could lead a reduction in the self perception of the limitation due to hip osteoarthritis in short-term [26], moreover the emergency situation, in the red zone, has probably changed the health needs of the Italian population. Pain perception in osteoarthritis is a sum of complex pathways influenced by local factors and central pain-processing pathways [27]. The exceptionality of the situation could even have an influence on mental health of the patients and several studies have analyzed the correlation of mental status and osteoarthritis pain perception [28, 29].

Different studies, all from China, examined the frequency of specific mental health-related variables in persons affected by the COVID-19 outbreak, emphasizing an increase in anxiety, depression, self-reported stress, disturbed sleep [30-33]. This is despite the fact that our patients have shown a gradual and progressive improvement in the painful symptoms associated with a minimal recovery of joint function in most cases, probably linked to a different perception of reality, developing new adaptive capabilities.

CONCLUSION

However, we underline the importance of performing this type of observational study in very particular situation like a global pandemia to better know the effect to improve the quality of life of the patients.

Conflict of interest

None.

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