

Artículo de investigación

Complications of local bonesetters' interventions in orthopedic patients admitted to Imam Khomeini Hospital in Urmia during the second half of 2015 and follow up of their treatment outcome by orthopedic physician

Complicaciones de las intervenciones de detractores locales en pacientes ortopédicos ingresados en el Hospital Imam Jomeini en Urmia durante la segunda mitad de 2015 y seguimiento del resultado del tratamiento realizado por un médico ortopédico

Complicações das intervenções dos bancos de ossos locais em pacientes ortopédicos internados no Hospital Imam Khomeini em Urmia durante o segundo semestre de 2015 e acompanhamento do resultado do tratamento pelo médico ortopedista

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Abstract

Local bonesetters are part of the health system in many developing countries. Their acceptability is beyond the boundaries of social classes and religious educations and beliefs. The objective of this research is to evaluate the causes of people admission to local bonesetters and the complications of local bonesetters' interventions in orthopedic patients and to follow-up the outcome of their treatment. In a prospective study with follow-up, patients' demographic information, complications of bonesetters' interventions, the reason for patients' admission to these individuals, the cost spent in this process and the delayed time for admission of these people to medical specialized services were collected. Data were analyzed by SPSS 21 software. In this research, a total of 61 patients were examined, which 28 (45.9%) of the patients stated that they would admit to bonesetter in the case of re-fracture. The main reason to admit to bonesetter among the patients was low cost of admission to bonesetter in 20 cases (32.8%), belief in better treatment by bonesetter in 12 cases (19.7%), lack of trust in medical system in 7 cases

Resumen

Los sobanderos locales forman parte del sistema de salud en muchos países en desarrollo. Su aceptabilidad está más allá de los límites de las clases sociales y las enseñanzas y creencias religiosas. El objetivo de esta investigación es evaluar las causas de la admisión de personas a los sobanderos locales y las complicaciones de las intervenciones locales de las personas que arreglan fracturas en pacientes ortopédicos y hacer un seguimiento del resultado de su tratamiento. En un estudio prospectivo con seguimiento, la información demográfica de los pacientes, las complicaciones de las intervenciones de sobanderos, la razón por la cual los pacientes ingresaron a estas personas, el costo invertido en este proceso y el tiempo de demora para la admisión de estas personas a servicios médicos especializados fueron recogidos. Los datos fueron analizados por el software SPSS 21. En esta investigación, se examinaron un total de 61 pacientes, de los cuales 28 (45,9%) de los pacientes declararon que admitirían el sobandero en caso de fractura. La principal razón para admitir que los pacientes tenían mala

(11.5%), recommendation of acquaintances and friends in 13 cases (21.3%), and short period of treatment by bonesetter in 9 cases (14.8%). This rate of admission to local bonesetter is directly correlated to the socioeconomic level of patients. Specialized orthopedic remedial measures following local bonesetters' interventions sometimes lead to failure and lack of recovery.

Keyword: local bonesetter, complications of non-medical interventions, orthopedics, follow up of treatment outcome

conducta era el bajo costo del ingreso en 20 casos (32.8%), la creencia en un mejor tratamiento por parte de los sobanderos en 12 casos (19.7%), la falta de confianza en el sistema médico en 7 casos (11.5%), recomendación de conocidos y amigos en 13 casos (21,3%), y corto período de tratamiento con sobanderos en 9 casos (14,8%). Esta tasa de ingreso al huesero local está directamente relacionada con el nivel socioeconómico de los pacientes. Las medidas de remediación ortopédicas especializadas después de las intervenciones locales a veces llevan al fracaso y a la falta de recuperación.

Palabra clave: huesero local, complicaciones de intervenciones no médicas, ortopedia, seguimiento del resultado.

Resumo

Os desossadores locais fazem parte do sistema de saúde em muitos países em desenvolvimento. Sua aceitabilidade está além dos limites das classes sociais e dos ensinamentos e crenças religiosos. O objetivo desta pesquisa é avaliar as causas da internação de pessoas nos consertos locais e as complicações de intervenções locais de pessoas que fixam fraturas em pacientes ortopédicos e monitorar os resultados de seu tratamento. Em um estudo de acompanhamento prospectivo, informações demográficas dos pacientes, as complicações de intervenções hueseros, a razão pela qual os pacientes foram admitidos a essas pessoas investiram neste atraso de custos e tempo de processo para a admissão destes pessoas para serviços médicos especializados foram coletadas. Os dados foram analisados pelo software SPSS 21. Nessa investigação, foram examinados 61 pacientes, dos quais 28 (45,9%) dos pacientes declararam que admitiriam o preparador de ossos em caso de fratura. O principal motivo para admitir que os pacientes apresentavam mau comportamento foi o baixo custo de admissão em 20 casos (32,8%), a crença em melhor tratamento por parte dos consertadores de ossos em 12 casos (19,7%), a falta de confiança na sistema médico em 7 casos (11,5%).), recomendação de conhecidos e amigos em 13 casos (21,3%), e curto período de tratamento com fixadores de ossos em 9 casos (14,8%). Essa taxa de internação para o organizador de ossos local está diretamente relacionada ao nível socioeconômico dos pacientes. Medidas especializadas de remediação ortopédica após intervenções locais às vezes levam ao fracasso e à falta de recuperação.

Palavras-chave: matriz local, complicações de intervenções não médicas, ortopedia, monitoramento do resultado.

Introduction

In many developing countries, local bonesetters still play an important role in the initial treatment of fractures (Waever et al., 2018). A local bonesetter is a non-specialist in manipulating joints and bones. S/he repairs fractures without taking any formal courses in approved medical institutions (Costa et al., 2015). Local bonesetters are abundantly seen outskirts and rural areas of developing countries, working as the ones available for orthopedic services with cheaper fees in areas where modern orthopedic services are not present. They serve their clients at their homes

and have their own specific customers in rural areas (Porrino et al., 2014; Sharp & Edwards, 2017). Local bonesetters are more popular because they have had a long history before recognizing orthopedic knowledge, and due to the reasons such as easy access, affordability, cultural beliefs, and quick services and so on. There is a deep faith in local bonesetters in plenty of developing countries (Kim, Kim & Koh, 2016; Yuan et al., 2017). Most patients with fractures refer to a local bonesetter before entering the hospital, and uses specialized orthopedic services in a hospital if they are

untreated or side-effects happen due to the treatments by local bonesetters (Ayalon et al., 2016). In a study, Gölge et al. reported that despite the improved and easier access to and use of hospital services, many people referred to local bonesetters. Their results showed that, regarding referring to local bonesetters, socio-cultural and educational issues are much more important than financial ones (Turan et al., 2016). Despite the medical problems and the often harms of referring to local bonesetters, it is still a common technique as an alternative treatment; hence, it can be helpful to improve the level of education and public awareness of the complications caused by referring to bonesetters (Wijffels & Ring, 2011). A local bonesetter treats fractures using a technique that involves the resetting of bone fragments by manipulating the components of the area, fixing the components using 1.5 - 2 feet long pieces of stick and closing the stick pieces together by a rope at the fracture site to keep them stable (Porrino et al., 2014; Sharp & Edwards, 2017). Despite their popularity, in many cases, this type of treatment is followed by unacceptable outcomes, leading to gangrene, and deaths caused by sepsis / septicemia, menstruation and anemia in severe cases. Other complications reported include incomplete welds, not welding the broken organ, chamber syndrome, transformation of closed fractures to open ones, osteomyelitis and soft tissue infections, joint disorders, joint stiffness and ankylosis, septic arthritis, pressure ulcers and shakes, iatrogenic fractures, etc. (Buijze & Ring, 2010; Ekenstam & Hagert, 1985; Palmer and Werner, 1981; Lindau et al., 2000). Generally, there is no formal training program, initial competence or legal supervision for local bonesetters, causing lots of troubles (May, Lawton & Blazar, 2002). Regarding all of the mentioned factors and because of the poor knowledge of the complications of this dilemma in Iran, the present study was designed to find out why orthopedic patients refer to local bonesetters in Urmia city, to discover the complications of their non-specialized interventions in fractures, to realize the link between the times of referrals to bonesetters and socio-cultural characteristics of the individuals referred, and to examine outcomes of their treatment by the orthopedic physician.

Materials and methods

In a prospective study based on following up, all of the patients who referred to the

orthopedic clinic of Imam Khomeini Hospital of Urmia in the second half of 2015 were studied. They had referred to local bonesetters due to a trauma, and then referred to the clinic for the complications caused by the bonesetters' interventions. Those with limb trauma who referred to a local bonesetter were included in the study, while the patients who had an intervention by an orthopedist or physician before referral to a bonesetter were excluded. The population consists of all of the patients who met the above-mentioned inclusion criteria. Patients' information was collected via a questionnaire pre-made by the researcher, used in similar previous studies. Patients' demographic information, complications from bonesetters' interventions, the reason for the referral to bonesetters, the cost spent in this process and the delayed time for referral to specialized medical services were asked from the participants and included in the questionnaire. Patients were followed up by an orthopedist for three months and the results of treatment with medical interventions were recorded at the end of the third month after the discharge of the patient. The results of the treatment were described by desirable, acceptable and unacceptable status, and the criteria to do this included wound healing, bone weld and successful use of the prosthesis. Finally, the data was statistically analyzed by SPSS version 21.

Results

During a period of 6 months, 61 patients were referred to the orthopedic clinic of Imam Khomeini Hospital in Urmia; 44 patients (72.1%) were males and 17 of them (27.9%) were females. The mean age of them was 34.03 ± 2.75 with a minimum age of 11 years and the maximum of 75 years old. 38 patients (62.3%) lived in Urmia, 9 patients (14.8%) in the villages around Urmia and 14 of them (23%) were non-Urmia residents. In terms of educational level, 21 patients (34.4%) were illiterate, 24 patients (39.3%) had elementary education, 11 patients (18%) had guidance school educations, 2 patients (3.3%) had diploma, and 3 patients (4.9%) had undergraduate education. In terms of income, 26 patients (42.6%) earned less than 500 thousand tomans per month, 27 patients (44.3%) earned 500,000 - 1,000,000 tomans and 8 patients (13.1%) earned 1.5 to 2 million tomans. Moreover, 3 patients (4.9%) were businessmen, 13 patients (21.3%) were workers, 10 of them (16.4%) were farmers, 2

patients (3.3%) were carpenters, 22 patients (36.1%) were students, 4 patients (6.6%) were unemployed and 7 of them (11.5%) were housewives.

In terms of how the cases were acquainted with the bonesetter, 22 patients (36.1%) were motivated by his advertisement and 39 patients (63.9%) by families and friends. 28 patients (45.9%) had referred to a bonesetter before, but 33 patients (54.1%) were referred to for the first time. On the other hand, 28 patients (45.9%) had a history of referring to an orthopedist, while 33 (54.1%) had no history of referral to an orthopedist. 28 participants (45.9%) stated that in the event of further fracture, they will return to the bonesetter, but 33 patients (54.1%) will not. 20 patients (32.8%) cited the cheaper fees as their main reason for referring to a bonesetter, while 12 cases (19.7%) believed in better treatment by the bonesetter, 7 cases (11.5%) didn't trust in the medical system, 13 of them (21.3%) referred because of families and friends' recommendations, and 9 patients (14.8%) cited the short duration of treatment as their main reason for referring to the bonesetter.

In terms of the frequency of visits by bonesetters, 23 patients (37.3%) were visited just once, 30 of them (49.2%) twice and 8 cases (13.1%) several times. The average cost of treatment by bonesetters was 6781 ± 1161.78 tomans, while the average cost of treatment by an orthopedist was 4521.5 ± 54615 tomans. Regarding the organs involved, 43 cases (70.49%) were related to the upper limbs and

18 cases (29.5%) were related to lower limbs. Humorous, rotator cuff, forearm, forearm distal, wrists, metacarpal, carp and scaphoid, and palm damages were reported for the 4 (6.55%), 3 (4.9%), 8 (13.1%), 15 (24.6%), 2 (3.3%), and 11 (18%) cases, respectively. In the case of lower limbs, damages to knee, leg, ankle, and foot were reported among the 4 (6.6%), 7 (11.5%), and 3 (4.9%) cases, respectively.

Patella fracture was diagnosed in one case (1.6%), knee trauma in three cases (4.9%), ligament injury in 4 cases (6.6%), leg fracture in 4 cases (6.6%), ankle sprain in 4 cases (6.6%), ankle fractures in 4 cases (6.6%), metatarsal fracture in 3 cases (4.9%), rotator cuff damage in 3 cases (4.9%), humerus fracture in one case (1.6%), supracondyl fracture in 3 cases (4.9%), radius bad welding in 6 cases (9.8%), distal radius fracture in 16 cases (26.2%), ulna fracture in one case (1.6%), scaphoid bone fracture in 3 cases (4.9%), wrist trauma (no fracture) in 3 cases (4.9%), metacarpal fracture in 4 cases (6.6%), and finger fracture in 2 cases (3.3%). Moreover, the type of damage was reported as the following: closed fracture in 49 cases (80.3%), and soft tissue damage in 12 cases (19.7%). The main complication due to the interventions by the bonesetter was reported to be bad welding in 15 cases (24.6%), not-welding in 3 cases (4.9%), skin complications in 3 cases (4.9%) (gangrene, an infectious cutaneous ulcer, skin necrosis per case), and motor restriction in 40 cases (65.6%) (Table 1).

Table 1: Distribution of complications from bonesetter interventions in the studied population

Bonesetter's intervention complications	Absolute Frequency	Relative Frequency
Bad welding	15	24.6 %
Not welding	3	4.91 %
Skin complications	3	4.91 %
Motor restriction	40	65.6 %

Persistent pain amongst the 10 patients (16.4%), non-recovery in 47 cases (77%), and movement restriction amongst the 4 patients (6.6%) were reported as the main reason for referring to an orthopedist.

The results of the treatment by technical orthopedic actions led to complete recovery in 10 cases (16.4%), relative recovery in 44 cases (72.1%), and non-recovery in 7 patients (11.5%). The technical actions included open reduction and internal fixation as K-nailing and plating for 15 cases (24.6%) and closed reduction and manipulation under anesthesia, and PCP for 2 cases (3.3%), splinting and plaster casting for 4 cases (6.6%), plaster casting alone for 25 patients (41%), splinting alone for 3 cases (4.9%), pharmacotherapy and physiotherapy for 4 patients (6.6%), physiotherapy alone for 3 cases (4.9%), physiotherapy and splinting for 5 cases (8.2%) and no specific action because of patient's

concomitant inhibition in the case of one patient (1.6%) (Table 2). Persistence of pain, and persistence of the symptoms despite the above actions were considered as the criteria for non-recovery. Improvement of all or some of the symptoms for which the patient referred to the physician or the radiologic or clinical improvement of the complications were considered as the criteria for recovery.

Table 2: Distribution of specialized measures for patients

The specialized action	Absolute Frequency	Relative Frequency (%)
Plating and K-Nailing Open Reduction and Internal Fixation as	15	24.6
Closed Reduction, Manipulation under anesthesia, and PCP	2	3.3
Splinting and plaster casting	3	4.9
Plaster casting alone	25	41
Splinting alone	3	4.9
Pharmacotherapy and Physiotherapy	4	6.6
Physiotherapy alone	3	4.9
Physiotherapy and splinting	5	8.2
No specific action because of the companion's inhibition	1	1.6

Discussion

Historically, local bonesetters have played a significant role in providing basic health care. It is one of the oldest medical practices taken by many individuals, especially in developing countries (Kim, Koh & Do, 2010; Krämer et al., 2013; Belloti et al., 2010). The World Health Organization has reported that in most of developing countries, fractures are frequently treated by local bonesetters and using traditional drugs (Wrist fractures, 2016). Since local bonesetters do not have any familiarity with human anatomy, physiology, prevention, and control of infection, the risk of fracture complications is likely enhanced (Wong et al., 2004).

Participants of the present study were 11 to 75 years old, with an average age of 34.03 ± 2.75 years. This average belongs to the efficient and productive group of the society. Studies have shown that in this age group, working population of the society very often suffer from bone trauma due to occupational and activity exposures (Khader & Towler, 2017; St. Mary's Health System Distal Radius Fractures of the Wrist, 2016). In our study, approximately, 45.9% of the patients, despite the complications from bonesetters' intervention, still stated that they will refer to them if fracture occurs again. This is in line with the study by Elujoba et al. (Rozenal & Blazar, 2006) which suggests the faith in local bonesetters in the culture and thoughts of this group of patients, and enlightenment-based activities can hardly make a difference in these thoughts. Our findings showed that 32.8% of patients choose

bonesetter mainly because of low cost which was consistent with the findings of Onyemaechi et al. (Kim, Kim & Koh, 2016). They conducted a study on 120 patients and realized that 30 cases (25%) mentioned the low cost as their main reason for referring to local bonesetters. In the similar study by Ekeré and Echem (Ward, Kuhl & Adams, 2011), friends and families' recommendation was cited as the main reason for choosing treatment by local bonesetters than an orthopedic physician. As it was expected, the cost of technical orthopedic services, even despite using health insurance coverage, was higher than the cost of treatment by a bonesetter in the current project as well. In addition, 34.4% of the patients referring to local bonesetters were illiterate and 39.3% of them had elementary level of education. Gölge et al. (Turan et al., 2016) also reported that despite the increase and acceleration of the patient's referral to hospital, a large number of patients still prefer local bonesetters; thus, this is mainly a sociocultural and educational issue.

This implies that cultural beliefs are directly related to the level of academic education of individuals and this can be helpful in changing patients' attitude towards referring to local bonesetters. The complications from local bonesetters' interventions have also been repeatedly reported in various studies (Buijze & Ring, 2010; Ekenstam & Hagert, 1985; Palmer & Werner, 1981; Lindau, Adlercreutz & Aspenberg, 2000; May, Lawton & Blazar, 2002); also confirmed in our research. This study indicated that major complications associated with bonesetters included bad welding in 24.6% of cases, not-welding in 4.9% of them, skin

complications in 4.9% of the patients and motor restriction in 65.6% of them. Orthopedic therapy in this group of patients resulted in complete recovery of 16.4% of the patients, relative recovery of 72.1% of them, and non-recovery of 11.5% of the cases. This suggests that, in spite of the clear positive impact of technical orthopedic actions following local bonesetters' interventions, to compensate for the inevitable damages caused by such interventions is not always possible.

Conclusion

According to the discussion, it can be concluded that despite the obvious clinical complications, referring to local bonesetters are still popular amongst the various strata of the community and the rate of referral is directly related to the socioeconomic level of the patients. Orthopedic corrective actions following bonesetters' interventions might be unsuccessful, resulting in not recovery.

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