



Complications of Musculoskeletal Injuries Treated by Traditional Bonesetters in a Developing Country

KEYWORDS

Traditional, bonesetter, complication, developing country, patronage

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ABSTRACT *Introduction: Traditional bone setting is a well recognized and age long practice in Nigeria. This treatment often leads to severe complications. Aim of this study is to evaluate the complications seen in patients previously treated by traditional bonesetters (TBS) and to assess the reasons for the patronage and the factors that predispose to these complications.*

Materials and methods: This was a one-year prospective study involving 72 consecutive patients presenting with complications related to treatment of their musculoskeletal injuries by bonesetters. The data obtained using observer-administered questionnaires include: demography, details of initial injury, reasons for patronage of TBS, method of treatment by TBS, duration of the treatment, the mode of treatment, the number of TBS visited and the complications at presentation. Data were analyzed by SPSS (Version 17), P value < 0.05 was significant.

Results: One hundred and eight complications from 93 musculoskeletal injuries were seen in 72 patients; 50 (69.4%) were male and 22 (30.6%) were female. The age range was 3 - 80 years (mean 36.8 years). The commonest complications were joint stiffness 29 (26.9%) and malunion 17 (15.7%). The major reasons for TBS patronage were advice of relatives and friends 25 (34.7%) and cheaper cost in 24 (33.3%) patients. The use of local splints was the commonest method of treatment, and the average duration of treatment was 94.5 days.

Conclusion: TBS treatment is associated with severe complications. There was a significant association between the complications and the methods of treatment. Training and licensing of bonesetters may help to control this menace.

Introduction

In many developing countries, the traditional care of diseases and injuries remain popular among the citizens despite civilization and the existence of modern health care services (1, 2).

In Nigeria, traditional bonesetters (TBS) are an integral part of trauma care. They perhaps more than any other group of traditional caregivers enjoy high patronage and confidence in the society. Their acceptance and patronage cut across social strata, educational qualification and religious beliefs.

There is widespread belief in our society that TBS are better and treating musculoskeletal injuries than orthodox practitioners (2). The reasons for this include the belief that diseases and afflictions have spiritual components which cannot be treated by orthodox means. Many also consider TBS treatment to be cheaper (2-5) while others are afraid of operation or amputation at an orthodox hospital (6).

In Nigeria, the TBS receive no formal training and practice without any form of license. Consequently, the outcome of their intervention in trauma care is characterized by complications, which include loss of limbs, life-long deformities and sometimes death.

These complications pose a major challenge to Nigerian orthopaedic surgeons as they form a large number of cases seen by them and also create a lot of problems in terms of management (3-4).

The treatment methods adopted by the TBS lack scientific basis which make limb and life threatening complications inevitable. Some of these dangerous practices include the use of tight local splints made of wood around fracture sites with consequent tourniquet effect and the use of excessive traction and massage at injury sites with attendant possibility of non-union and heterotopic calcification. Others are the use of local herbs and concoction in wound dressing which can cause infection and osteomyelitis and a virtually non-existent rehabilitation program.

Previous studies (7, 8, 9) have reported various types of complications of musculoskeletal injuries treated by TBS, the reasons for the patronage and outcome of treatment of these complications.

However, there is paucity of reports on the factors that predispose patients to these complications.

The objective of the study is to evaluate the types of complications seen amongst patients whose injuries were previously treated by TBS, the reasons for TBS patronage and determine the factors that predispose to these complications.

Material and Method:

This was a prospective study of all patients with musculoskeletal injuries treated by the traditional bonesetters before presenting to the Accident and Emergency unit or the orthopaedic out-patient clinic of the Federal Medical Centre Makurdi (FMCM) North Central Nigeria.

FMCM is a tertiary hospital in Makurdi, the capital city of Benue State North Central Nigeria that serves a population of over 5 million people. It has a full complement of orthopaedic and trauma services. Approval for this study was obtained from the hospital's ethics committee. All the patients who met the inclusion criteria within the study period January to December 2011 formed the population size. An observer administered questionnaire was used to obtain information from the patients.

We established a cause-effect relationship by interviewing the patients about the mechanism of the original injury, the methods and materials used in the treatment by the TBS.

A clinical assessment was done to establish the existence of a complication of the treatment which qualified the patients to be enlisted for this study. Patients in whom complication could not be established clinically or radiologically were excluded from the study.

The data collected from the patients included the sociodemographic profile; details of the initial injury; reasons for TBS patronage; materials and methods used by the TBS, mode of treatment (out-patient or admitted); reason for abandoning the TBS treatment; the number of TBS visited; the duration of the treatment and complications at presentation. Clinical and radiological assessments were done to document the complications at presentation. The patients were treated and followed up for 12 - 18 months after treatment. The data were analyzed using the SPSS (version 17) and level of statistical significance was set as p - value less than 0.05.

Results:

One hundred and eight complications from 93 musculoskeletal injuries were seen in 72 patients within the one year study period. There were 50 (69.4%) male and 22 (30.6%) female patients (M:F=2.2:1). The age of the patients ranged from 3 to 80 year with a mean age of 36.8 years. The majority of the patients were in the first, third and fourth decades of life (figure 1).

28 (38.9%) had primary education, 39 (54.1%) patients had either secondary or tertiary education and 5 (6.9%) patients had no formal education.

23 (31.9%) students and pupils were the largest group of people followed by 13 (18.1%) drivers and labourers. Road traffic accident accounted for 69.4% of all the injuries. Others were falls from height 12 (16.7%); domestic falls 8 (11.1%) and sports injuries 2 (2.8%). The initial injuries sustained by the patients as shown in table 1 indicates that closed fractures 38 (40.8 %) were the commonest injuries.

The duration of treatment by the TBS ranged from 2 to 312 days with a mean duration of 94.5 days.

The tibia was the commonest site of long bone fracture in 22 (23.6%) cases. This was followed by the femur 12 (12.9%) and humerus 8 (8.6%) cases. Seven (7.5%) patients had spinal injuries. The complication profile of our patients as shown in table 3 shows that joint stiffness 29 (26.9%) was the commonest complication. Others include malunion 17x (15.7%); limb gangrene 12x (11.1%); chronic osteomyelitis 12x (11.1%) and non-union 10x (9.3%). The methods of treatment by the TBS were massaging and application of local splints (40.3%), only splintage (12.5%), manipulation and splintage (12.5%) massage and application of local herbs (34.7%). Majority of the patients with lower limb injuries 40x (67.8%) were mobilized with locally made crutches with full weight bearing within 3 weeks and 19 (32.2%) patients were mobilized between 4 to 6 weeks.

The reasons for patronizing the TBS were mainly due to pressure from relatives and friends in 25 (34.7%) patients and perceived cheapness of the TBS treatment in 24 (33.3%) pa-

tients. Traditional belief 9x (12.5%), faster recovery 6x (8.3%), easy accessibility 6x (.8.3%) and fear of operation or amputation 2x (2.8%) were other reasons for seeking TBS care.

All the patients discharged themselves from the TBS treatment. 65% was due to dissatisfaction with the treatment and 35% due to onset of complications.

56 (77.8%) patients were treated by only one TBS, 10 patients (13.9%) were treated by 2 TBS before presentation.

Two children who had limb gangrene died because their parents refused to give consent for amputation due to traditional beliefs, giving a mortality rate of 2.8%.

There was no association between the complication and the age, sex, level of education and the occupation of the patients ($P > 0.05$).

However, there was a significant relationship between the site and type of initial injury as well as the method of treatment and the complications ($P = 0.001$).

The correlation between the complications and mode of treatment, duration of treatment and number of TBS visited was not significant ($P > 0.05$).

The patients with non-union and malunion were treated by open reduction and internal fixation. The chronic osteomyelitis was treated with surgical debridement with antibiotic beads implantation with good results. The patients with gangrene had amputation.

Soft tissue release was done for Volkmann's contracture and open reduction was done for the unreduced dislocations.

The patients with avascular necrosis of the femoral head and post-traumatic osteoarthritis were counseled for joint replacement. Physiotherapy was recommended for joint stiffness with the aim of achieving a functional range of movement and 5 patients had open arthrolysis with good results. The patients with pressure sores and wound infection had wound care.

There patient were followed up for 12 - 18 months after the treatment with satisfactory results.

Discussion:

108 complications arising from traditional bonesetters' treatment were reviewed in this series. The mean age of the patients was 36.8 years which is similar to reports by other authors (7, 8, 9) This shows that young adults most commonly sustain musculoskeletal injuries because of the wide range of activities engaged in by this group of people (10, 11, 12).

The male preponderance recorded in this series as in most trauma series emphasizes the fact that males are more often exposed to injuries than females. They are more often exposed to traffic as either drivers or travelling long distances to work and are more active in sports.

Students and pupils constituted the largest group of patients in this study. They are another active group of people who are usually minors or financially dependent on their parents and caregivers. They are unable to take critical decisions about their health and only follow the decisions of the parents and caregivers. The next largest group of patients was the drivers and artisans who are low income earners. They are vulnerable to injuries and have no access to health insurance and may not afford treatment in the hospitals. In contrast, the civil servants who have access to health insurance constituted only 13.9% of the patients, and less likely to seek TBS treatment. Access to health insurance was the factor responsible for the low patronage of TBS by civil servants ($p < 0.05$). However, there was no significant association between the

complications seen amongst the patients and their age, sex or occupation ($P > 0.05$).

The patronage of TBS treatment in this study was determined by several factors. The commonest reason for patronizing the TBS was the advice of relatives and friends. This fact is similar to findings by previous authors (9, 13) but differs from other studies (2, 5, 8, 14) which reported cheaper cost as the commonest reason.

The opinion of relatives and friends is an important factor in many African countries because of the existing social system. The communal lifestyle often involves relatives and friends contributing to defray the cost of treatment as well as suggesting where treatment for ailments and injuries may be sought.

The cost of treatment was another important factor. It was discovered that 78.1% of the study population were either low income earners or people who had no income at all. They have no access to health insurance and have to pay for health care by 'out of pocket' method.

This group of people will find the payment in installments or in kind offered by TBS very attractive.

The injuries treated by the TBS in this study involved virtually all parts of the body. Majority were closed injuries, a finding similar to other studies (4, 8, 9, 13, 15). It would appear that the bonesetters are reluctant to treat open injuries.

Altogether 49.5% of the fractures occurred in the diaphysis of long bones while 11.9% were metaphyseal. Major joint injuries accounted for 27.9% of the injuries while spine and soft tissue injuries were 7.5% and 3.2% respectively. The tibia was the most frequently fractured bone in this series. Chowdhury et al. (16) reported a similar finding which corroborates the fact the tibia is the most commonly fractured long bone because it is frequently exposed to injury by reason of its location.

To our knowledge, no previous study has reported treatment of spinal injuries by the TBS.

In this study, seven patients with spinal injury were treated by the TBS before they reported to hospital. This may be explained by the lack of neurosurgical services in Makurdi. Head and spinal injuries are treated by the orthopaedic surgeons or referred to another centre for treatment. Two of the patients who had paraplegia claimed they were able to move their lower limbs before being taken to the bonesetters.

This is a dangerous trend in trauma care in Nigeria and requires proactive measures by all stakeholders in the health sector to address it.

Onumiya et al. (4) and Alonge et al. (15) have reported that the method of diagnosis by the bonesetters is the major problem in their practice. It lacks scientific basis and is shrouded in mystery resulting in administration of inappropriate treatment. However, from this study, the method of treatment appears to be a more important factor in development of complications.

There was a significant association between the complications and the method of TBS treatment ($P = 0.001$). The use of local splints made of wood and bandages was the commonest method of treatment.

The application of tight local splints in acute injuries with consequent tourniquet effect resulted in limb ischemia and gangrene. The patients were made to believe that the more painful splints were more effective only for them to develop gangrene or Volkmann's contracture later. The dressing of open fractures with local herbs and concoctions was associ-

ated with development of chronic osteomyelitis and wound infection. These local herbs and concoctions which were not prepared hygienically were only culture media for micro-organisms. It was not surprising that their direct application to wounds and open fractures resulted in infections. Prolonged immobilization of joints in local splints was associated with joint stiffness. In the attempt to immobilize long bone fractures, the adjacent joints were encased in the splintage often in extension. These splints were left for several months even when the patients were ambulant.

Failure to reduce the fractures and premature weight-bearing were also associated non-union and malunion. The patients who had obvious deformities had the sites of injury manipulated before splints were applied. No radiographs were taken to confirm reduction of the fractures and the patients were made to believe that early weight bearing was needed for the fractures to heal fast.

There was also a significant relationship between the site and type of injury and the complications ($P = 0.001$). Malunion was associated more commonly with metaphyseal fractures and non-union occurred more commonly with closed fractures of diaphysis of long bones especially the humerus and femur. Most of the joint injuries resulted in stiffness and post-traumatic osteoarthritis. Majority of the open fractures resulted in osteomyelitis following dressing with local herbs and concoctions.

The commonest complication in this series was joint stiffness. This is contrary to previous studies that reported malunion (7, 8, 9, 16) and limb gangrene (4, 17) as the leading complications in their studies.

This finding may be explained by the inordinate use of splints to immobilize joints for long period of up to 16 weeks even for soft tissue injuries by the TBS. The methods of treatment by the TBS in the other studies may also be different and the type of injuries sustained by the patients may also be a factor. The functional disability caused by this complication was serious and in most cases was the primary reason for presenting to the hospital. The long term economic loss in these patients who are in the productive age group can be quite enormous. Malunion was the next commonest complication followed by limb gangrene.

'Bonesetters gangrene' appears to be the most studied complication of TBS treatment in Nigeria (4, 5, 13 - 15, 17). This is so because of the severe consequences of permanent disability or loss of life caused by this complication as well as the fact that children are most commonly involved.

Twelve gangrenous limbs were reported in this series and 66.7% occurred in children. Majority of the children sustained supracondylar fractures while playing, which was simple to treat and inexpensive while some sustained only soft tissue injuries.

The mortality in this study was from children who presented with wet gangrene and septicemia but their parents refused to give consent for amputation.

Majority of our patients were treated by the TBS on out-patient basis. This however, was not a factor in the development of complication ($p > 0.05$).

The mean duration of the TBS treatment was 94.5 days. This was longer than the reports of Olaolorun et al. (7) and Chowdhury et al. (16) but shorter than the report of Dada et al. (8). However, there was no association between the complication and the duration of treatment, ($P > 0.05$).

The number of bonesetters visited before presenting to hospital did not affect the type of complication since their methods of treatment were similar ($P > 0.05$).

We observed that 44.4% of patients were taken to hospitals immediately after the injuries. Their wounds were cleaned and sutured and haemodynamic problems corrected before they took their discharge against medical advice to the bonesetters.

This would suggest that the patients want their wounds treatment by the orthodox practitioners and the fractures by the bonesetters.

This pattern had earlier been reported by Popoola et al (18) and further emphasizes the tenacious traditional belief in our society that bonesetters treat musculoskeletal injuries better than the orthodox medical practitioners.

Conclusion

The complications of bonesetters' treatment appear to be predictable and are preventable. These complications continue to be a challenge to many orthopaedic surgeons and have been demonstrated to be closely related to bonesetters' methods of treatment. Pressure from relatives and friends and perceived cheapness of the TBS treatment were the main reasons for patronage.

Tutoring of bonesetters on safe methods of treating simple injuries as demonstrated by Solagberu (19) and Eshete (20) can be utilized to control these preventable complications.

Licensing and integration of the bonesetters into the primary healthcare system will help to minimize these complications. Awareness programs regarding the poor outcome of TBS treatment are necessary and their patronage should be discouraged.

There is need for the Nigerian government to improve the health insurance coverage in Nigeria which at the moment is approximately 30%. This will make healthcare easily accessible by all the citizens.

Injury	Frequency	Percent (%)
Closed fracture	38	40.8
Open fracture	19	20.4
Dislocation	3	3.2
Fracture dislocation	16	17.2
Spinal injury	7	7.5
Sprain	7	7.5
Soft tissue injury	3	3.2
Total	93	100%

Table 1: Types of Initial Injuries

Site of injury	Frequency	Percent %
Humerus	8	8.6
Radius/ulna	4	4.3
Shoulder	3	3.2
Elbow	10	10.8
Wrist	2	2.2
Femur	12	12.9
Tibia	22	23.6
Hip	7	7.5
Knee	10	10.8
Ankle	8	8.6
Spine	7	7.5
Total	93	100%

Table 2: Site of initial injuries

Complications	Frequency	Percent %
Limb gangrene	12	11.1
Malunion	17	15.7
Non union	10	9.3
Chronic osteomyelitis	12	11.1
Joint stiffness	29	26.9
Volkman's contracture	2	1.8
Avascular necrosis	2	1.8
Post-traumatic arthrosis	5	4.6
Unreduced dislocation	6	5.6
Paralysis	2	1.8
Pressure sore	7	6.5
Wound infection	4	3.7
Total	108	100%

Table 3: Complications of TBS treatment

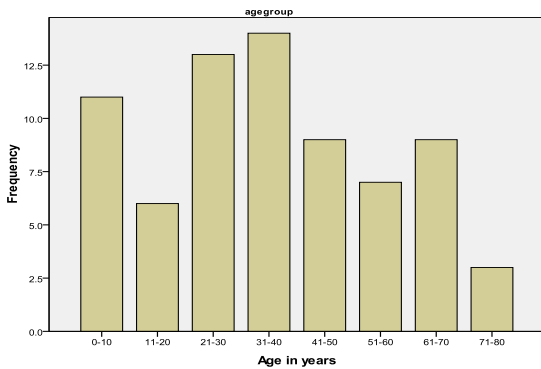


Figure 1: Distribution of patients by age

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