EFFICACY OF OTTAWA RULES IN ACUTE ANKLE INJURIES IN PATIENTS ABOVE 7 YEARS OF AGE

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ABSTRACT

Ankle injuries are most common in adult papulation. It is most of the time cumbersome to decide treatment on clinical examination and assessment. Majority of times patients are subjected to unnecessary radiography and delay. This leads to overburdening of casualty set ups and wastage of resources to be allocated to the needy and deserved patients. In our set up most of our patients stress on radiographs to be advised just for no reasons. On the other hand quiet often the injury is taken a minor one leading to non-unions, chronic ankle pain and instabilities. Commonly performed radiography is Anteroposterior x-rays and in few circumstances CT is advised on patients complaints and demands.

Objective: To evaluate the efficacy of Ottawa ankle rules and its benefits in ankle injuries to rule out false positive patients thus to avoid unnecessary radiography and wastage of resources**.**

Design: Descriptive cross sectional study (Case series)

Material and methods: The study was conducted at department of orthopaedics and traumatology Khyber teaching hospital Peshawar kpk Pakistan from august 2015 to December 2016. Parameters like age, sex and fracture side and level with reference to radiology were recorded on a preformed proforma. SPSS version 17 was da analysing tool in our study.

Results: A total of 102 patients (n=102), 80(n=78.44%) males and 22(n=21.56%) females were evaluated for efficacy of Ottawa ankle rules. Mean age of the patients was 34.95 ±14.81(2SD) years with the range of 8 to 71 years.41 patients had negative criteria for ankle radiography and showed no fracture .61 patients were fulfilling criteria for ankle radiography in which 50 patients showed fractures around the ankle. The sensitivity of Ottawa ankle rules to detect fracture is 100%. By this study the efficacy of Ottawa ankle rules is 59.8% to eliminate unnecessary radiographs.

INTRODUCTION

Ankle injuries are the most common presentation in the emergency departments. It has been determined that only 15% of these patients have fractures around the ankle. The incidence of ankle fractures is 122 per 100000 per year[1].

Ankle injuries are very frequent but few of these presenting to the emergency departments have fractures. In most of the hospitals and emergency care set ups most of the patients are opted for radiography, frequently almost 85% of these radiographic examinations are futile and showing no fractures[1-5]. Majority of ankle and foot injuries are not only subjected to conventional extensive radiography with its attending radiation hazards but also they undergo unnecessary stay in the emergency care where other patients needing stay and evaluation can be addressed[6-10]. The extensive use of radiation is not only having its adverse effects but also is a social and financial issue especially for underdeveloped and developing third world countries. Subjecting every patient to the process of non-specific evaluation and unnecessary radiography would be having a bad socioeconomic impact[6,7].

Ottawa ankle rules devised and established in 1992 is pioneering mile stone towards the assessment and evaluation of ankle injuries[1,8,11,12]. Ottawa ankle rules is a clinical tool which is helpful by its efficacy, specificity and cost effectiveness and time sparing .It very skillfully solve and vanishes out the issues of non-specific evaluation ,patient overcrowding, unnecessary radiation with its hazardous sequelae, financial burden on the hospitals and time factor as well[13-16]. Various studies have been performed showing promising result about Ottawa rules application and its efficacy[17-20]. One of the Asian studies showing efficacy of 89.6% to 100% for fracture detection .This has led to the development of interest in the use and application of Ottawa rules specifically in our set up.

The purpose and objective of the study is to evaluate the efficacy and validity of Ottawa ankle rules in our set ups. As there is no data and practically no work is available locally and countrywide, the study will provide a baseline tool for assessment and diagnosis of ankle fractures and will lessen the socioeconomic burden on our low budgeted hospitals. The results of the study will be extrapolated and shared to all the

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hospital and orthopedic set ups in the public as well as in private sector to ease their ankle injury evaluation and to provide a basis for further studies.

OBJECTIVE

To determine the efficacy of Ottawa rules in ankle injuries in patients above seven years of age. The validity and sensitivity of Ottawa ankle rules to detect fractures in acute ankle injuries,to rule out false positive cases and to determine patients who really need an x-ray in ankle injuries. To reduce unnecessary ankle radiographs.

OPERATIONAL DEFINITIONS

Ottawa rules (ankle rules):

Ottawa rules are an objective criteria truly called clinical decision rules states that radiography of ankle joint is recommended only if there is

1. Pain in the malleolar zone (both medial and lateral) and midfoot area.
2. Bone tenderness along the distal 6 cm of the posterior edge of tibia or tip of medial malleolus
3. Bone tenderness along the distal 6 cm of the posterior edge of fibula or tip of lateral malleolus

OR

4. An inability to bear weight both immediately and in the emergency department for four steps. Fulfilling one or more out of these four rules will opt the patient to ankle radiography.

Ankle injuries

Close Injuries to the area of the leg and foot including distal 6 cm of tibia and fibula, tibio talar and tibiofibular joints and midfoot area by all mechanisms presenting within first 24 hours of occurrence.

MATERIAL AND METHOD

This case series or descriptive cross sectional study was performed at Department of Orthopedics and Traumatology, Medical Teaching Institution (MTI) Khyber Teaching Hospital Peshawar Pakistan from august 2015 to December 2016. Patients inclusion criteria was

1. All patients above seven years of age.
2. Patients with close isolated ankle injuries i.e. injury to only one ankle left or right.

Patients exclusion criteria was

1. Patients below seven years of age.
2. Patients with poly trauma.
3. Patients with pathologic fractures.
4. Patients with open injuries.
5. Patients with neuromuscular disorders.

All patients received via casualty department and referrals from lower hospitals set ups fulfilling the inclusion criteria were subjected to Ottawa criteria for ankle and those patients fulfilling criteria underwent an x-ray ankle anteroposterior and lateral views. All the particulars of the patients were listed on a predesigned proforma after fully explaining the aim and purpose of the study to the patients/attendants and obtaining written and informed consent.Patients radiographs were studied and tailored to their symptoms. The data was analyzed using Statisticall Package for Social Sciences (SPSS) version 17.

RESULTS

A total of 102 (n=102) patients, 80(n=78.44%) males and 22(n=21.56%) females were evaluated for efficacy of Ottawa ankle rules. Mean age of the patients was 34.95±14.81 (2SD) years with a range of 8 to 71 years.

Table 1

Mechanism o injury	No of patients
Fall/ twisting injury	57 (55.88%)
Road Traffic Accidents(RTA)	35(34.31%)
Running and sports injuries	10(9.8%)

Table 2: Fracture pattern

Area involved	No of fractures
Malleolar area	40(80%)
Medial malleolus	13
Lateral malleolus	22
Malleolar	4
Calcaneus	O
Talus	1
Midfoot area	10(20%)
Navicular	1
Cuneiforms	2
Cuboid	2
Base of 5th metatarsal	5
Total fractures 50	

Table 3

Variable	Value
Sensitivity	100%
Specificity	65.6%
Negative productive value	100%

Out of 102 patients 57(55.88%) had fall and twisting injuries in daily activities, 35(34.31%)patients had injuries due to RTA and 10(9.8%)patients had running and sports related injuries(Table 1).

Out of total 41 patients had negative criteria for ankle radiography and showed no fracture .61 patients were fulfilling criteria for ankle radiography in which 50 patients showed fractures around the ankle in which 40(80%) were in the malleoli and 10(20%) were in the midfoot zone (Table2).

The sensitivity of Ottawa ankle rules to detect fracture is 100%. By this study the efficacy of Ottawa ankle rules is 59.8% to eliminate unnecessary radiographs. The sensitivity of Ottawa ankle rules was 100% and negative productive value was too 100%. The specificity was 65.6% by our study (Table 3). Our study showed that Ottawa ankle rules reduced the need of unnecessary radiographs by 59.8% which indicates its efficacy as very applicable and productive.

DISCUSSION

Injuries around the ankle are very common and frequently present in the accident and emergency department. About 15 % of patients are having fractures presenting with ankle injuries. Very less no of patients actually need radiography. It is very difficult to sort out patients actually needing radiography .Ottawa ankle rules is very helpful in such scenarios. It was first devised and introduced in 1990. It is rapidly becoming an important tool in accident and emergency scenarios because of its simplicity , its efficacy in reducing financial costs of the patients, saving time of the attending surgeon which is to be allotted to needy patients and lessening burden on emergency set ups.

Several studies have been performed in the world specifically in Asia proving validity and efficacy of Ottawa ankle rules. Meena S and Gangay SK performed a prospective cross sectional study enrolling 140 patients showing 100% efficacy and 78.7%. Their study validated Ottawa ankle rules in reducing unnecessary radiography by 51%.

Ottawa ankle rules is a very important tool in unifying decision making for different physians working in different circumstances with variable clinical calibers. Without an objective and comprehensive criteria for assessment of patients it would be difficult for clinicians in making decision and there would be a lot of difference of opinion as well.

In our community there is no study on Ottawa ankle rules so for locally and at national level therefore our study holds key place in our literature. Our results are similar and comparable to other studies in the world and Asian countries. Our study showed 100% sensitivity, 100% negative productive value and with a specificity of 65.5%. From our results Ottawa ankle rules reduced unnecessary radiography by about 59.8%. These are quiet promising results. With the application of these rules radiography and time can diverted to the needy patients. In our study one confounding factor was the pressure of the attendants and patients for radiography because of low education and awareness of our patients. Without this the radiography ratio would have been decreased further i.e. more than 59.8%.

CONCLUSION

Our results are similar to other studies showing sensitivity of 100% i.e. no false negative. So a patient not fulfilling Ottawa ankle rules criteria surely need no radiography and should not be opted for unnecessary radiography. Ottawa ankle rules reduces radiography need up to 59.8% which is having a good socioeconomic impact on our busy and resource less casualty set ups.

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