

Ottawa Ankle Rules for the use of Radiography in Acute Ankle Injuries in Black South African Patients

Scribante, L

MB, ChB, MMed (Family Medicine)

Meyer, HP

MB, ChB, MPraxMed (UP), MFGP

Blitz, J

BSc, MB, BCh, MPraxMed

Correspondence to:

Dr. L. Scribante

Department of Family Medicine,

University of Pretoria

PO Box 667, Pretoria, 0001

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Abstract

The Ottawa Ankle Rules are a quick and reliable method of selecting which patients presenting with ankle injuries need X-rays to exclude an ankle fracture. This study was undertaken to test the applicability of these Ottawa Ankle Rules to Black patients presenting at a South African casualty unit with an ankle injury. It is concluded that applying

these rules can significantly decrease the number of X-rays done on patients with ankle injuries. Application of the Rules was again found to be 100% sensitive for predicting medial and lateral malleolar fractures. In other words, no patient found not to need X-ray investigation by application of the rules will have a malleolar fracture.

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Introduction

Injuries of the ankle are the most common musculo-skeletal injury seen by physicians.¹ Up to 12% of injuries seen in casualty units and 15 % of all sports injuries are injuries of the ankle joint.² This is mostly due to the inherently unstable nature of the ankle joint.

According to Stiell, however, only 15% of injured ankles show any radiological abnormality.³ This has enormous cost implications for medical care, since a large proportion of people presenting to physicians with ankle joint injuries have radiological studies done.

In Ottawa a set of Rules was formulated for the evaluation of an injured ankle joint, to determine which should be sent for radiological examination and which could safely be said not to have a fracture.³

The above study found the Ottawa Rules to be 100% sensitive for diagnosing fractures, whilst the amount of radiological testing done on ankle injuries was decreased 28% by their implementation.

OTTAWA ANKLE RULES³

An X-ray of the ankle is necessary when the patient has pain over the medial or lateral malleolar zone **AND any one of the following findings:**

- There is bone tenderness on palpation of the distal 6 cm of the fibula
- There is bone tenderness on palpation of the distal 6 cm of the tibia
- There was an inability to bear weight **both** immediately after injury and during the clinical examination.

There is almost no South African literature available on ankle injuries and specifically no literature could be found on the Black patient. It was therefore not possible to determine whether the Ottawa Rules could be used in a Black population.

A study was therefore undertaken at the Kalafong Hospital in Pretoria to

evaluate the Ottawa Rules in a predominantly Black patient population.

Methods

The study population was patients presenting at the hospital casualty unit between 1 November 1997 and 31 May 1998. Patients who were older than 16 years of age, and had an ankle injury of not older than 7 days, qualified for the study. All patients who qualified were enrolled prospectively on days when the researcher was working in the unit. The principal researcher was the only examiner for the duration of the study.

The ankle was defined as the distal 6 cm of the lower leg to the osnaviculare. "Injury" was defined as any incident that was perceived by the patient as having caused hurt to the ankle.

Other details recorded were: age and sex of the patient; activity they were participating in at the time of the injury; where the patient had pain and if s/he could walk at all times after the injury.

The patient was then examined by the

researcher and a note was made of which, if any, of the Ottawa Rules the patient met. All patients were then sent

for X-rays of the ankle. AP, lateral and oblique views were requested. The researcher interpreted the X-rays and

correlated the radiological findings with the clinical diagnosis.

Results

Fifty-four patients were enrolled in the study. Fifty-two percent were male and 50% were between the ages of 26 and 35 years (see Figure 1). All patients were Black.

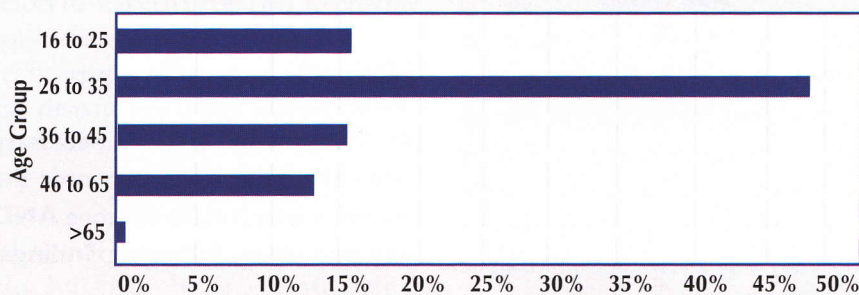
By using the Ottawa Rules the results tabulated in Table I were obtained. Of the 54 patients enrolled in the study, only 17 (31%) were found to have radiological fractures. Twenty-six patients (48%) qualified for X-rays in terms of the Ottawa Rules, and 17 of them subsequently were found to have a fracture on X-rays (65% Positive Predictive Value). All 28 patients that did not fulfill the Ottawa Rules also did not have a fracture on X-rays (100% Negative Predictive Value). This results in a sensitivity of 100% (17/17) and a specificity of 76% (28/37) for this study.

Only 52% of the patients who reported that they were unable to walk at any time after the injury did have a radiological fracture. Of the 48% able to walk, 16% were shown to have a fracture.

Table I: Ottawa findings compared to X-ray findings

	X-ray fracture YES	X-ray fracture NO	Totals
Ottawa POSITIVE	17	9	26 (48%)
Ottawa NEGATIVE	0	28	28 (52%)
Totals	17 (13%)	37 (69%)	54 (100%)

Figure 1: Age distribution of patients with ankle injuries



Discussion

The use of the Ottawa Rules in this study would have resulted in a 52% decrease in the number of X-rays taken. Most importantly, no patient with a fracture would not have had an X-ray taken, because the Ottawa Rules were 100% sensitive for fractures in this study. However, there is a 20% difference in the decrease of radiological examinations done in this study and the original. Possible explanations for this discrepancy is the smaller patient sample used in this study or a difference in the definition of the potential number of X-rays needing to be performed between the two studies.

The positive predictive value of 65% and the negative predictive value of 100% found in this study correlates well with the results obtained in the original Ottawa study.³

It is further important to note from this study that no single factor in the history gives a reliable method of determining the grade of injury. More specifically, to only ask about an inability to walk without incorporating the other criteria, would result in missed fractures.

We therefore conclude that the Ottawa Ankle Rules were found to be a quick and reliable method to assess the need for radiological examination in the

primary management of acute ankle injuries in a Black South African population.

References

1. Anderson SJ. Evaluation and treatment of ankle sprains. *Compreh Ther* 1996;22: 30–8
2. Ruben A, Sallis R. Ankle ligament injuries – a personal view. *Am Fam Phys* 1996;54(5): 1609–18
3. Stiell I. Ottawa ankle rules. *Can Fam Phys* 1996;42: 478 – 80