
CLINICAL ARTICLE

An evaluation of the quality of orthopaedic trauma referrals to a regional hospital

ND Naidoo

MBChB, Dip PEC(SA), HDipOrth(SA), FC(Orth)(SA)

Consultant, Department of Orthopaedic Surgery, Nelson R Mandela School of Medicine, University of KwaZulu-Natal

Reprint requests:

Dr ND Naidoo

Department of Orthopaedic Surgery
Nelson R Mandela School of Medicine

University of KwaZulu-Natal

Private Bag X7

Congella

4013

Tel: (031) 260-4297

Fax: (031) 260-4518

Email: naven33@webmail.co.za

Abstract

Background:

The purpose of this prospective study was to assess patient referrals to a regional hospital with respect to communication, quality of referral letters, transfer times, investigations, diagnostic accuracy, initial management as well as associated and missed injuries.

Method:

All in all 88 patient referrals were assessed prospectively over four months by a single investigator utilising a questionnaire.

Results:

The average age was 41 years. Eighteen of the injuries (20%) were compound fractures. The average transfer time of closed injuries was 10 hours and 8 minutes and for compound injuries it was 4 hours and 20 minutes. Twenty patients (23%) were not discussed prior to transfer. Referring doctor details were deficient regarding the name 10 (11%), contact details 58 (66%) and designation 82 (93%). No receiving physician was listed in 23 (26%) referrals. Deficiencies were noted in describing the mechanism of injury (58%), time of injury (47%), type of splinting (60%) and type of analgesia (12%). Referrals of compound fractures showed a description of wound care in 11 (61%) referrals, antibiotic therapy in 9 (50%) and tetanus prophylaxis in 3 (16%). A total of 53 (60%) referrals presented without haematological investigations and 84 (95%) presented with radiological investigations, of which 54 (64%) were inadequate. Diagnostic errors emerged in 16% of referrals with a missed injury rate of 10%.

Conclusion:

Supervision, training and regular assessment of junior doctors is essential to improve the quality of patient care by the referring hospitals.

Introduction

King Edward VIII Hospital (KEH) offers secondary and tertiary level orthopaedic care.¹ Interns, community service medical officers, medical officers, registrars and consultants form the spectrum of referring professionals.

Early and timeous referrals have been shown to reduce health care costs

Initial communication is telephonic with a discussion of the patient's clinical presentation followed by a decision by the receiving physician whether to allow a transfer or not.

De Prado Prieto *et al* demonstrated an increase in the practice of defensive medicine.² Defensive treatment resulted in early referrals without adequate assessment at the institution of appropriate primary care. The value of communication was highlighted by Piterman and Korsitas, who showed a general sense of dissatisfaction on the part of practitioners and patients when communication was not clear.³

Early and timeous referrals have been shown to reduce health care costs.⁴ Accompanying investigations obviate the cost of repetition and provide baselines for monitoring. Inadequate investigations, especially in the radiological domain, pose both an economic and a health risk with increased cost and radiation exposure incurred through the repetition of X-rays.⁵ Diagnostic errors in the casualty setting have been shown to vary from 6% to 17.2%.⁶⁻⁸ The literature is fragmented with respect to the assessment of orthopaedic referrals. No studies have focused on the essentials of orthopaedic referrals. The aim of this study was to evaluate the quality of referrals by district and regional hospitals of orthopaedic trauma patients with fractures requiring admission to our teaching hospital.

Materials and method

A descriptive, quantitative methodological approach was selected and a questionnaire was developed and utilised for the purposes of the study. Objectives included an assessment of the referrals with specific reference to communication, quality of the referral letter, transfer times, appropriateness of investigations, diagnostic accuracy, adequacy of initial management and missed injuries. Further objectives were to determine the implication of the findings on the development of treatment and transfer protocols as well as the implications for orthopaedic undergraduate training.

A saturation sampling procedure was utilised with the recruitment of consecutive patient referrals. Eighty-eight patient referrals with an age range of 5–92 years and an average age of 42 years were assessed over a 4-month period. Gender distribution was M:F 1:0.92.

Results

An analysis of transfer times demonstrates that it required approximately the same amount of time for a patient with a compound fracture to reach the receiving hospital irrespective of the distance travelled. Times ranged from 3 hours within a 50 kilometre radius to 4 hours 50 minutes from a radius in excess of 200 kilometres.

Eighty-seven patients presented with referral letters but 23% were not discussed prior to transfer. Sixty-six per cent of referring doctors did not provide contact details

and the majority (93%) did not indicate their designation. Twenty-six per cent did not indicate the name of a receiving doctor (*Figure 1*).

Forty-two per cent of referral letters did not indicate the mechanism of injury and 40% did not state whether splinting was effected. Fifty-three per cent did not provide the time of injury and in 88% analgesic therapy was not mentioned (*Figure 2*). Eighteen patients had compound fractures and information was found to be lacking in this important subset with only 50% of the referrals indicating antibiotic administration, 39% not describing wound care and 84% not indicating the administration of tetanus toxoid (*Figure 3*).

Assessment of investigations revealed that only 40% of the referrals presented with haematological investigations and 95% of patients presented with X-rays, of which two-thirds were inadequate. Treatment of compound fractures was inadequate in more than 60% of each of the four categories assessed, i.e. splinting, analgesia, wound care and antibiotics.

The diagnostic error rate was 16%. Our data demonstrated a missed injury rate of 10% with one patient requiring urgent referral for a laparotomy with a diagnosis of peritonitis secondary to blunt abdominal trauma (*Figure 4*).

Discussion

There has been no previous audit of referrals in our setting which makes it difficult to find appropriate comparisons for our results. The need for patient transfer is determined by the referring physician and is based on the limitations, resources and incapacity of the referring hospital.⁹

Transfer should always be preceded by adequate patient resuscitation and investigation. Responsibilities of the referring doctor include initiation of the transfer, consultation with the receiving doctor, stabilisation and establishment of a transfer agreement. The mode of transport is also a function of the referring doctor.⁹ The receiving doctor is responsible for providing the referring doctor with assistance in initial management and ensuring that the receiving institution is capable of managing the patient.⁹

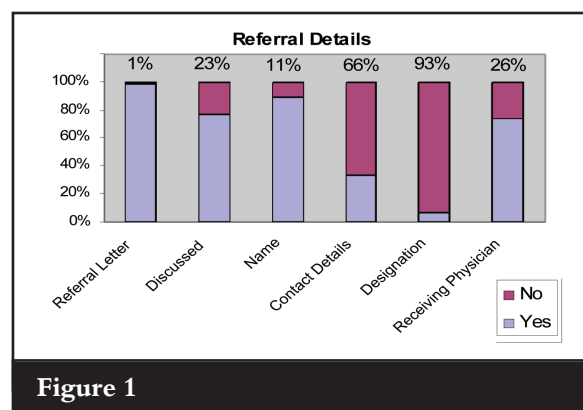


Figure 1

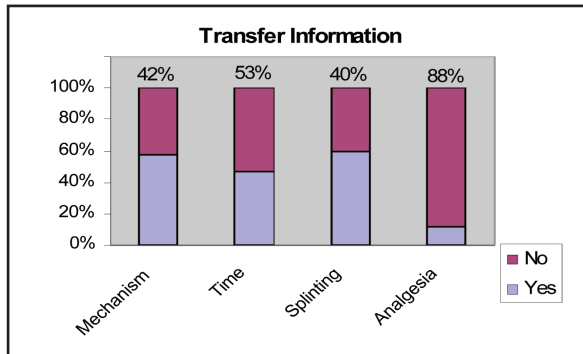


Figure 2

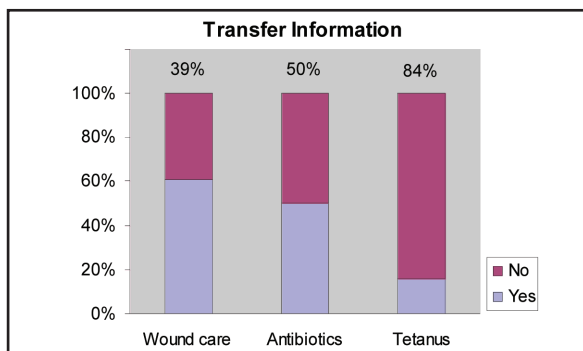


Figure 3

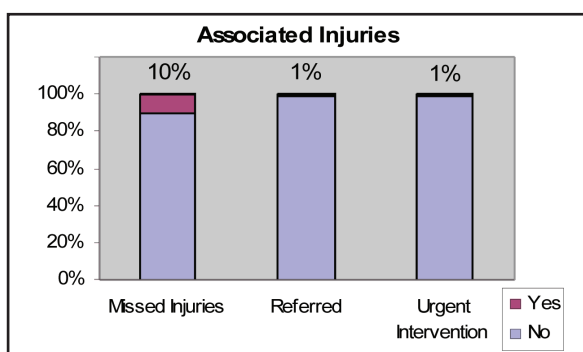


Figure 4

Communication was shown to be markedly deficient in this study with referral letters misrepresenting the patient presentation as well as not providing adequate basic information regarding the treatment administered. Documentation should include demographic details of the patient, record of the time of injury and presentation, condition of the patient, diagnostic studies and treatment rendered. The referring and receiving doctor's details should also appear on the referral letter.

Road transport was justifiably utilised in all patients reviewed. Transfer times are instrumental in patient outcomes especially in the subset of patients with compound fractures.¹⁰ Basic principles of acute orthopaedic intervention were shown to be lacking. Splinting and

analgesia, which are important initial components of fracture management, were deficient. Patients with compound fractures should receive early antibiotic therapy coupled with wound care and tetanus toxoid administration.¹⁰⁻¹³ The data collected indicated that compound fractures were inadequately managed by the peripheral hospitals.

Appropriate and adequate initial investigations should accompany the patient in order to expedite decision-making. Poor initial investigations amount to inadequate resource utilisation. The diagnostic error rate demonstrated in this study (16%) was high when compared with the majority of the literature with Kremli demonstrating a 6% and Wardrope and Chennels noting 6.2% error rate.^{6,7} Factors including polytrauma, poor clinical assessment, inadequate radiographs, interpretation and failure to recognise patients' symptoms and signs have been implicated by Kremli.⁶ There have been reports of higher error rates with Morton noting 17.2% in a sample of 250 patients referred from the accident and emergency unit to the orthopaedic clinic.⁸ Removal of plaster cast in 49% and alteration of the cast in 25% of patients were done by orthopaedic clinic staff where incorrect management was instituted based on diagnostic errors.⁸ In contrast Wardrope and Chennels found that a change in management strategy was only required in 1.1%.⁷ These studies however were undertaken within a single hospital auditing their respective accident and emergency departments and did not consider the referral of patients from district and peripheral hospitals. The incidence of missed injuries is 3-12% which compares with our results (10%).¹⁴

Conclusion

Skilled personnel should be encouraged to service the district hospitals to ensure the appropriate management of patients and dispersion of knowledge and skills. General practitioner fellowships have proved valuable in ensuring appropriate management of orthopaedic patients at district level in the United Kingdom.

Telemedicine, e-mail and multimedia messaging services (MMS) provide an alternative means of communication for peripheral hospitals. They allow rapid access to specialist advice regarding emergent management. This may be limited by economic constraints in our setting which could be offset by economic gains from appropriate and timely management. Despite the small sample size in this study key problems are highlighted. Further studies in our developing world setting will assist in providing population-specific data for policy generation.

The content of this article is the sole work of the authors. No benefits of any form have been derived from any commercial party related directly or indirectly to the subject of this article.

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