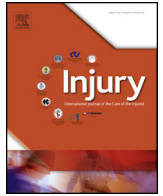




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Smoking cessation advice in limb reconstruction: An opportunity not to be missed

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ABSTRACT

The adverse health effects of smoking are well known, including its effects on the musculoskeletal system. Limb reconstruction using external fixators is a high intensity process with high levels of patient contact time, complications and cost. The aim of this study was to examine smoking patterns in this group and in particular to assess trends in smoking cessation.

Data was collected from 41 patients all undergoing treatment using circular frame external fixation, for a variety of pathologies, most commonly acute tibial trauma. A patient reported questionnaire was used. Data was collected over a six-month period.

In our population 56.1% of patients were smokers. During the study 47.8% patients stopped smoking and a further 39.1% decreased their smoking behaviour. 78.3% of patients could recall being given smoking cessation advice. In our group, 87% of patients were unaware of the effects of smoking on bone healing. Once made aware during discussion of proposed treatment, 73.9% stated that it was, in part, this knowledge that prompted them to positively change their smoking habits.

The results of this study show that advice regarding smoking cessation during limb reconstruction treatment can potentially have a positive impact on patients smoking habits. The effect of smoking should be linked to the patient pathology and discussed during the consent process.

Taking the time with the patient for this simple free intervention can have a positive impact on patient health, and potentially on the outcome of their current treatment, and is an opportunity not to be missed.

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Introduction

The adverse health effects of smoking are well known, with smoking being the biggest preventable killer and cause of major morbidity and healthcare associated expense in the UK [1]. Smoking affects many systems in the human body. It has been linked to cancers of most common areas particularly lung and oropharynx. It is responsible for chronic lung, cardiovascular and cerebrovascular disease and is still the leading cause of premature death in UK [1]. More specifically, related to this project, the effects on the musculoskeletal system and fracture healing are well documented [2–7]. In addition, the smoking related effects in the perioperative period are well established, as are the effects on anaesthesia, wound healing and post-operative complications. It

has been shown that, smoking cessation can result in 20–30% reduction in complications [8–11].

According to UK Statistical data around one in five adults over the age of 16 smoke in the UK (19%) [12]. The average number of cigarettes smoked per day is eleven, with women smoking slightly less than men and with unemployed people twice as likely to smoke as those in employment (35% compared to 19%) [12]. Data shows that a large percentage of smokers, about two thirds, express a desire to quit. However only 30–40% attempt this per year and less than this are successful [12].

Limb reconstruction using external fixators is a high intensity process with a high levels of patient contact time when compared to other methods of orthopaedic treatment. Patients undergoing this treatment often have complex pathology and prolonged treatment durations. By the nature of their injury or pathology they are prone to a range of complications including pin site infections and delayed- or non-union. This means that the orthopaedic team form a close relationship with the patient during this period, and the treatment and complications carry a significant healthcare cost [13].

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Much of the evidence of smoking's adverse effects had been taken from both animal and human studies using spinal fusion models [5]. However, from the results of recent systematic reviews there is good evidence that smoking has a significantly adverse effect on the healing of tibial fractures as well as many other orthopaedic conditions [5,6]. One of the striking conclusions of this work is that there is a 40% increase in the chance of a non-union and an equal increase in the time to union in smokers [5,6]. However, patients' knowledge of these effects has been shown to be limited [14].

Although the evidence of the effects of smoking on bone health and fracture healing is good there is less evidence on the effects of smoking cessation, particularly the timing [5]. Regarding general perioperative complications, a cessation period of at least four weeks has been proposed but several months may be required according to some studies [4,3,15]. This is has been shown to help with general post-operative anaesthetic complications and also so have an effect on wound healing [3,4,8]. However, abstinence times may need to be as long as six months in order to achieve a positive effect on bone healing [3,4].

Smoking cessation advice forms part of the smoking cessation pathway. The UK National Institute of Clinical Excellence (NICE) recommends that clinicians should be aware of their patient's smoking status. In addition, they recommend that patients are asked if they are interested in quitting and if so they should be referred to a smoking cessation service. If they are struggling to abstain then they should be offered smoking cessation pharmacotherapy. NICE also suggest that this smoking cessation advice is linked directly to the patient health condition [16].

It is well known that up to two thirds of smokers are considering quitting and an event involving injury or surgery may represent a "teachable moment". In some patients the event is enough to promote cessation and in others the impact of smoking cessation advice may be more effective in the promotion of smoking cessation at this key time [10,17,18]. There is evidence supporting a wide range of smoking cessation techniques and adjuvants ranging from brief interventions through counselling to pharmacotherapy. A Cochrane review of the evidence suggested that interventions delivered in the peri-operative period were more effective, in some cases up to ten times [10].

In a busy limb reconstruction clinic setting detailed smoking cessation advice is not always possible or practical. However, knowledge of a patients smoking status, awareness of their willingness to quit and referral to the appropriate services are all easily put into practice, especially as we can link the effects of smoking directly to the orthopaedic pathology we are treating [16]. Evidence suggests that brief cessation advice delivered by surgeons and other members of the multidisciplinary team is an effective tool in smoking cessation, but is often underutilised [19].

It is suggested that discussion of the adverse effect of cigarette smoking should be included in the consent process and certainly with the recent changes to the consent laws in England this should be clearly documented [2]. In elective reconstruction practice, allowing sufficient time for cessation would be backed by the literature [2]. This is more difficult in the trauma situation but continued smoking is likely to have a negative effect, potentially both on the anaesthetic and surgical aspects of the case and patients should be counselled accordingly.

We wanted to assess the prevalence and impact of smoking cessation advice on our limb reconstruction group using a patient questionnaire, with a view to examining the incidence of smoking in this population and the prevalence of smoking cessation advice, and to assess the impact of any smoking cessation advice and support given.

Materials and method

We collected data from consecutive patients undergoing circular frame external fixation during their treatment course using our patient questionnaire over a six-month period. We collected demographic data including initial pathology, co-morbidities, type of treatment, employment status. Verbal consent to complete the questionnaire was obtained from all patients and we felt the information collected should form part of a normal history and its collection did not constitute a deviation from normal patient care and had no effect on the treatment which they were undergoing. The questionnaire was administered by a member of the team not responsible for the initial consultation to try to eliminate bias.

If patients had never smoked or had stopped smoking prior to their treatment they were excluded from further questioning. This information gave us the prevalence of smoking in our population. From the smokers we collected data on their smoking history including type of product smoked, amount and duration, allowing us to calculate smoking pack years.

We then asked patients if prior to their treatment they were aware of the impact of smoking on fracture healing. Patients were asked if they could recall being given any form of smoking cessation advice during their treatment. Patients were then asked to indicate how their pattern of smoking changed following their treatment and what factors impacted on this change.

In our unit it was the limb reconstruction consultants who were responsible for delivering the smoking cessation advice and explaining in detail the negative impacts of smoking to the patients when they first met and prior to any planned surgery and also to reiterate this advice at every available opportunity for example immediately post op and in their regular OPD visits.

Patients were also asked if they had been offered any additional smoking cessation support such as face-face contact, tablets, patches or gum. Finally, patients who had stopped or cut down smoking were asked if they had managed to maintain this level, this was taken at the time point of the data collection.

We also reviewed the patient notes, via the electronic records, to see if there was documentation of a smoking history and any record of smoking cessation advice being given and any information on further treatment issued to the general practitioner. Data on fracture healing times and long term maintenance of smoking cessation was not collected in this study.

Results

We collected data from 41 patents during our six-month study period. The average age of patients in our group was 40 with a range of 19–72 years, with 68% male. The average American Society of Anaesthesia score (ASA) in our patient group was 1 with a range of 1–3. In this study group 46.3% of patients were unemployed. All of the patients in the group underwent treatment with a circular external fixator. Table 1 shows the types of pathology treated; acute tibial trauma was the commonest indication. In our trauma

Table 1
Pathology treated.

Pathology	N	%
Tibial Shaft Fractures	20	48.8
Distal Tibia intra-articular/Pilon Fracture	8	19.5
Proximal Tibia/Tibial Plateau Fractures	4	9.8
Failed Ankle Fracture Fixation	3	7.3
Deformity Correction	2	4.9
Osteomyelitis	2	4.9
Non-Union	2	4.9

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