The effects of cigarette smoking on fracture healing

*Figure 1.*No smoking sign (AIGA, 2008).

Does cigarette smoking hinder fracture healing?

By Kristy Pauling

Introduction

Approximately 20% of New Zealanders smoke, as well as over 40% of New Zealand Maori. This means a lot of the population's bones may not heal normally if they were to suffer a fracture. This is a big issue in Dunedin and is seen regularly at the fracture clinic. I decided to carry out this research on the effects of cigarette smoking on bone healing in order to see the significance smoking has on bone healing and whether the public needs to be better educated about the risks of smoking while they have a fracture.

*Figure 2.*Femur (Pinterest, 2015).

Literature Review

The literature review identified several negative effects of cigarette smoking on the body and fracture healing:

- Cigarette smoking has a range of adverse effects on the body including raising heart rate, blood pressure, and coronary blood flow which can hinder fracture healing (El-Zawawy, Gill, Wright & Sandell (2006).
- Nicotene is the main component of a cigarette. Miller (2014) stated that nicotine is a vasoconstrictor the decreases blood flow to the extremities. Blood flow is essential in fracture healing as the nutrients needed for healing are delivered to the site through the blood. Because of the abundance of nicotine in each cigarette, the effects of this chemical on the body are large and instantaneous.
- Surrounding soft tissue is damaged at a fracture site. El-Zawawy et al (2006) argued that carbon monoxide inhaled during smoking of cigarettes reduced the Oxygen carrying capacity of red blood cells to the site of injury, meaning less oxygen is available to promote healing in the site of soft tissue injury, and within the fracture itself.
- Smoking has a lasting effect on the body so there are long term health consequences.

Recommendations and Rationale

- Health professionals should advise each patient with a fracture who smokes to stop immediately to avoid delayed healing. The patient may not be aware of the health risks of smoking and ceasing will benefit healing and general wellbeing.
- Offer smoking cessation support to every patient who enters the practice. Quitting smoking is extremely difficult and almost impossible without adequate support. Supported patients will be more likely to be smokefree and have successful fracture healing.
- Be accessible to the patient for any information or support they require. This will help increase compliance and may help them cease smoking and enhance fracture healing and general health.

Conclusion

Cigarette smoking is detrimental to overall health and can lead to complications in fracture healing and delayed union in fracture sites. If health professionals use the above recommendations when dealing with patients with fractures who smoke, better fracture healing outcomes can occur and patients may receive the support they need to cease smoking indefinitely, increasing overall health and wellbeing.

References

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I have chosen to present the information from my literature review in a poster because I believe this information is very important for the public to know and should be presented in a format that is accessible to everyone. If this poster was presented in a nurse's office or other health provider environment, it could be viewed by families and also could be referred to by nurses and other healthcare providers in their health education.

Currently in New Zealand 21.1% of men and 18.8% of women smoke (Ministry of Health, 2015). The Maori smoking rate is at 41% in New Zealand (Dempsey, Hillege, & Hill, 2014). This is a large proportion of the population who could potentially suffer delayed bone healing if they were to continue smoking after a fracture. It is important that people are aware of the risks of smoking on bone healing and I think a poster would be the most effective way to present this information.

PECOT MODEL

I knew I wanted to explore the effects of cigarette smoking on the body but did not know what to specifically form my research question about. When conducting my literature search I used keywords such as cigarette smoking, nicotine, fracture, healing and carbon monoxide and found the information I retrieved linked to my prior knowledge around fracture healing. I therefore decided to focus on smoking and healing of fractures. I then used the PECOT model to further develop my research question. PECOT is an acronym which incorporates different elements required to create a holistic clinical question (Schneider, Whitehead, LeBiondo-Wood, & Haber, 2013).

My PECOT is as follows:

Population: Female and male adults over the age of 18 years old. This is the legal smoking age in New Zealand and is the age where bones should be fully developed in the body.

Environment: The person must be a regular smoker e.g. smoke at least daily. The person must continue their regular smoking habits when the fracture is healing.

Comparison: Compare to adults with a fracture in the same area that do not smoke at all to see the difference in healing time and quality.

Outcome: The intended outcome is that the fracture heals fully and adequately.

Time: No time limit is set on the healing of the fracture.

Schneider, Z., Whitehead, D., LeBiondo-Wood, G., & Haber, J. (2013). *Nursing and Midwifery Research: methods for appraisal for evidence-based practice.* Chatswood: Mosby Elsevier