

The effect of alcohol on surgical dexterity

Introduction

Common sense suggests that manual dexterity, such as that required of a surgeon, will be impaired as a result of alcohol intoxication and, perhaps, a hangover. Keyhole surgery, in particular; demands high levels of hand-eye co-ordination.

This study, carried out by Simon Smith and colleagues from the Imperial College School of Medicine, makes use of computer based assessment techniques to examine the effects of alcohol on surgical dexterity using a simulator. The aim was to explore possible impairments associated with a blood alcohol level similar to the legal driving limit. Twelve trainee surgeons and students were tested repeatedly with either alcohol or a placebo drink.

Findings

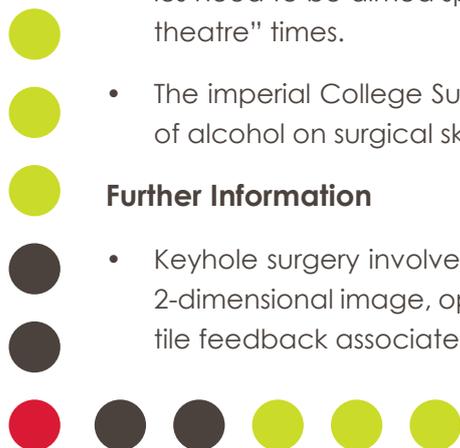
- One hour after consuming a dose of alcohol sufficient to obtain a blood alcohol level of 80mg%, there was a significant impairment in the time taken to burn a target at a distance. This is a frequently used keyhole surgery procedure. Other measures of dexterity showed similar trends but not statistically significant effects.
- With repeated testing, participants showed improvement when consuming the placebo drink. Simply performing the same tasks repeatedly, over an eight-hour period, resulted in improved performance. However, this learning curve was not seen after consuming alcohol.
- Significant differences in improved performance persist up to six hours after reaching a blood alcohol level of 80mg%.
- This effect is particularly strong when left-handed skills are tested in these right-handed participants.

Implications

- Impairment of learning is seen more than six hours after the ingestion of alcohol. No surgeon would condone alcohol intoxication whilst on duty but few surgeons would avoid consuming alcohol the night before operating. In the light of these findings the decision to drink the night before needs to be reconsidered. If impaired learning can be demonstrated six hours after reaching a blood alcohol level similar to the legal driving limit, then more excessive drinking could be very detrimental.
- Pilots have a strict rule on “bottle to throttle” time. There are no such rules for surgeons. Further studies need to be aimed specifically at these hangover effects with the aim of identifying safe “bottle to theatre” times.
- The Imperial College Surgical Assessment Device is a safe, objective method of exploring the effects of alcohol on surgical skills.

Further Information

- Keyhole surgery involves the ability to operate in a 3-dimensional environment whilst observing just a 2-dimensional image, operating with very long tools, without the possibility of receiving the normal tactile feedback associated with more traditional open surgery. It is easy to see how alcohol intoxication



or a hangover can impair performance of such complex skills.

- These skills are not assessed for the majority of surgeons. The imperial College Surgical Assessment Device analyses a wide range of surgical procedures, especially laparoscopic skills.
- In this study participants were randomly assigned to receive the placebo first or the alcohol first. They were tested before drinking either the placebo or the alcohol and then at intervals during the following eight hour period.

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