Nicotine and Smoking Effects on Burn Related Reconstruction Patient Outcomes and Complications Following Hospital Admission: Systematic Review and Meta-analysis

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INTRODUCTION

This new systematic review and meta-analysis compared outcomes and complications between nicotine/smoking use in burn patients admitted to the hospital to burn patients admitted without these characteristics. This review is an attempt to compile information to create a uniform set of data for clinical interpretation in diverse populations. Based on peer-reviewed literature, it was hypothesized that nicotine/smoking use would increase the risks of poor outcomes and complications in patients admitted to the hospital following a burn related injury, compared to burn patients admitted without any of these characteristics.

MATERIAL AND METHODS

Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines were followed throughout the literature search process to structure the framework for the review.

Search

A medical library informationist (MSM) conducted the initial literature search using four databases (MEDLINE via PubMed, Embase, Cochrane, and Web of Science) from inception to December 20, 2018. Reference lists of relevant articles were hand searched to identify additional relevant studies. All references were imported into Covidence (Veritas Health Innovation Ltd., Melbourne, Australia) and reference management software and duplicates were removed.

RESULTS

Data Extraction

Two reviewers (KKM and PS) systematically and independently performed the title screening, followed by abstract screening, and full article review to ensure quality and accuracy throughout the process. Any disagreements regarding studies to be included or excluded were resolved by discussion. If disagreements were still present after discussion, a third reviewer (CSH) resolved remaining conflict. The following data were extracted qualitatively and quantitatively for each study: type of study, sample size, male and female distributions, nicotine/smoking used on admission, hospital burn-related operations, graft loss/failure, percent total body surface area burned (%TBSA), depth of burn (superficial, partial thickness, full thickness), skin grafting, amputations, length of hospital stay (LOS), time period of wound closure, inhalation injury, number of days on a ventilator, rate of intubation, intensive care unit (ICU) LOS, mortality, overall infections, wound/local skin infections, sepsis, decubitus ulcer (hospital acquired pressure injury), deep vein thrombosis (DVT), pulmonary embolism (PE), renal failure, respiratory complications, and ventilation-associated events. If there were multiple reports from the same study, one data collection form was completed for the study from all of the reports to avoid duplicating results.

Table. Nicotine/smoking use individual study results

<table>
<thead>
<tr>
<th>Author</th>
<th>Group</th>
<th>Sample size</th>
<th>Male</th>
<th>Female</th>
<th>%TBSA (mean ± SD)</th>
<th>LOS (mean ± SD)</th>
<th>Intubation (mean ± SD)</th>
<th>ICU LOS (mean ± SD)</th>
<th>Mortality (mean ± SD)</th>
<th>Wound infection</th>
<th>Sepsis</th>
<th>Ventilation-associated event</th>
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</thead>
<tbody>
<tr>
<td>Nelson et al</td>
<td>Nicotine smoking</td>
<td>390</td>
<td>--</td>
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<td>11.4 ± 0.5</td>
<td>15.4 ± 0.9</td>
<td>7.8 ± 2.9</td>
<td>4.3 ± 2.0</td>
<td>12.6 ± 2.0</td>
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<tr>
<td>Nelson et al</td>
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<td>390</td>
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<tr>
<td>Griffin et al</td>
<td>Nicotine smoking</td>
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CONCLUSION

Compared to patients suffering from burn-related injuries who do not use nicotine and/or smoke, patients using nicotine/smoking were found to have a higher rate of intubation and more wound/local skin infections.

REFERENCES