Activity of the Antiseptic Polyhexanide Comparing Younger and Elderly Patients

Fabry W1*, Heppner HJ1, Reimer C2, Kock HJ3 and Vahlensieck W4

1Institute für Biomedizin des Alterns, Lehrstuhl Geriatrie Universität Witten/Herdecke, Germany
2Medizinische Klinik und Poliklinik, Uniklinik Hamburg-Eppendorf, Germany
3Unfallchirurgie Median Klinik am Burggraben Bad Salzuflen, Germany
4Fachklinik für Urologie Kurparkklinik Bad Nauheim, Germany

Received: December 18, 2018; Published: January 02, 2019

*Corresponding author: Fabry W, Institut für Biomedizin des Alterns, Germany

Abstract

The antiseptic polyhexanide was investigated in a placebo-controlled, prospective, and randomized double-blind study on patients with bacteria-contaminated wound types 2-4 comparing younger (< 65 years old, n=28) and elderly (≥ 65 years old, n=8) patients. The wound dressing with a 0.2% polyhexanide/macrogol solution was investigated in comparison to Ringer’s solution on days 0, 2, 4, 8, 11, and 15. Standardized swabs were taken on days 0, 2, 8 and 15 and investigated for microorganisms. An additive wound score for the condition of the wound base and the wound margin was determined. The use of polyhexanide led to a faster improvement of the wound score and a better reduction in microorganisms on the wound surfaces. This could also be observed in the subgroups of patients with different age. The findings suggest, that polyhexanide is also effective for the use in elderly patients.

Keywords: Polyhexanide, Wound Infection, Wound dressing, Elderly

Introduction

The care of geriatric patients is nowadays increasingly important, including the fight against infectious diseases. In the elderly patient, infections are usually more severe than in young people and end more often lethal. This can be due to many causes. The immune system ages, affecting both cell-mediated and humoral immunity. In addition, malnutrition, impaired organ function, and eventual polymedication play a significant role. As part of surgical procedures, the geriatric patient is at particular risk of infection. Patients 65 years or older have a 2.5-fold increased risk of infection complications. Respiratory and urinary tract infections, but also postoperative wound infections, occur more frequently in this age group. Postoperative wound infection accounts for around 17% of nosocomial infection and affects 2 - 5% of patients after surgery [1]. Antiseptics are effective against a broad spectrum of germs. They are characterized by a low development of resistance. The use of antiseptics has therefore come to the fore in the local treatment of infections.

The antiseptic polyhexanide has been shown to be more bactericidal and tissue compatible than other antiseptics. In a first
taken and the size of the wound was determined by planimetry. Wound dressing was applied using cotton dressing pads moistened with Ringer’s or polyhexanide solution. An aqueous stock solution of 20 % polihexanide and 1% macrogol was prepared ready for use by adding 2 ml of the mixture to 1000 ml Ringer solution (0.2%), giving a dilution of 0.4 mg/ml for the active ingredient polihexanide.

On days 0, 2, 4, 8, 11 and 15 the wound was evaluated again. Wound typing was performed blindly by an expert panel on the basis of the photographic documentation. For the purpose of this study the planned maximum duration of treatment of the soft tissue wounds was 15 days as in the case of uncomplicated healing within this time surgical wound closure was considered possible. The main outcome criterion was the course of the wound assessment by the clinical investigator, measured as additive wound score for the condition of the wound base (healed/beginning epithelialization 0, strong granulation (bleeding) 2, beginning granulation 4, decontaminated 6, infected 8, purulent infected 10) and the wound margin (healed/beginning epithelialization 0, strong granulation (bleeding) 2, beginning granulation 4, subsided 6, inflammatory swollen 8, callose 10).

As previously described standardized swabs were taken on days 0, 2, 8 and 15 and investigated for microorganisms by routine procedures. The number of colony forming units (CFU) was determined by a serial dilution technique [3].

**Results**

**Table 1**: Average wound score of patients treated with polyhexanide or Ringer’s solution.

<table>
<thead>
<tr>
<th>Day</th>
<th>Polyhexanide (n=28)</th>
<th>Ringer’s solution (n=8)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patients (n=20)</td>
<td>Patients (n=8)</td>
</tr>
<tr>
<td></td>
<td>&lt; 65 years</td>
<td>≥ 65 years</td>
</tr>
<tr>
<td>0</td>
<td>13.5</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>10.2</td>
<td>10.4</td>
</tr>
<tr>
<td>4</td>
<td>6.7</td>
<td>6.8</td>
</tr>
<tr>
<td>8</td>
<td>2.2</td>
<td>3.6</td>
</tr>
<tr>
<td>11</td>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>0.32</td>
<td>-</td>
</tr>
</tbody>
</table>

As expected from the previous investigations the wound score improved in general faster in the polyhexanide group than in the Ringer’s solution group. This could also be clearly observed in the subgroups of patients with different age (Table 1). The most frequently found pathogenic microorganism was Staphylococcus aureus, which was isolated from 8 wounds. Further isolates were Pseudomonas aeruginosa, Pseudomonas stutzeri, Acinetobacter baumannii, Enterobacter sp., Klebsiella pneumoniae, Morganella morganii, beta-haemolytic streptococci, Enterococcus sp., Streptomyces griseus, and Candida sp. Isolates of the Staphylococcus epidermidis group and Bacillus sp. were regarded as apathogenic. The use of polyhexanide led to a faster reduction in microorganisms on the wound surfaces. With the exception of one patient the number of CFU per cm2 wound remained constant or decreased, in contrast to the wounds treated with Ringer’s solution. This was true for younger and elderly patients.

**Discussion**

A number of other clinical studies have confirmed the efficacy of polyhexanide [5-16]. It also has antiseptic properties against methicillin-resistant Staphylococcus aureus and vancomycin-resistant enterococci [17-19]. Polyhexanide can be used for wound irrigation. It is also applicable to critically colonized and infected chronic wounds including burns and can be used for wound instillation in combination with negative pressure (negative pressure wound therapy). In contrast to Ringer’s solution in acute traumatic wounds, it showed a significant decrease in CFUs at 60 min [20]. In patients with chronic wounds (foot or leg ulcers) polyhexanide dressings reduced bacterial colonization and chronic wound pain after 5 weeks in comparison to dressings without polyhexanide [21]. Compared to a NaCl solution, more efficacy was achieved in reducing inflammatory signs and accelerating the healing of vascular leg ulcers and pressure ulcers [22]. In this study the application on elderly patients was investigated in particular. The current results suggest that polyhexanide is also effective for the use in elderly patients.

**References**


ISSN: 2574-1241
DOI: 10.26717/BJSTR.2019.12.002274
Fabry W. Biomed J Sci & Tech Res

This work is licensed under Creative Commons Attribution 4.0 License
Submission Link: https://biomedres.us/submit-manuscript.php

Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

https://biomedres.us/