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Original Article

Effects of honey dressing for the treatment of DFUs: A systematic review

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ARTICLE INFO

Article history:

Received 11 April 2014

Received in revised form

18 April 2014

Accepted 24 April 2014

Available online 9 May 2014

Keywords:

Diabetic foot ulcers

Honey dressing

RCTs

Systematic review

ABSTRACT

Background: Honey dressing has been applied to clinical practice for many types of disease for centuries. Many researchers have studied the effects of honey dressing for the treatment of DFUs (diabetic foot ulcers), and no systematic review has considered effects of honey dressing on DFUs. A systematic review performed to objectively evaluate the effectiveness of honey dressing in the treatment of DFUs.

Methods: We include all original studies found for the key words honey and diabetic foot ulcers. Mean effect sizes and confidence intervals are pooled from study effect sizes according to standard methods, and these are considered for various common types of honey dressing interventions separately.

Results: A total of 4 RCTs involving 258 participants were included, and 3 trials involving 228 participants met the quantitative analysis and 1 study involving 30 participants met qualitative analysis. Results of meta and descriptive analyses showed that total treatment time, Mean purge time of ulcers, ratio of purging germ, healed area of ulcers in honey dressing group are better than that of control group, respectively, and with statistically significant differences.

Conclusions: Honey dressing was superior of traditional dressing for treatment of DFUs. Due to limitations in the quantity of published studies, this conclusion has yet to be carried out in large, multicenter study to validate.

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Peer review under responsibility of Chinese Nursing Association



1. Introduction

DFUs and infections are a major cause of morbidity in patients with diabetes mellitus (DM) [1], and DFUs necessitate more hospital admissions than any other complication of DM [2,3], and are the main risk factor for no-traumatic lower-extremity amputations [4], DFUs have induced deeply impact on life quality of patients with DFUs [5]. The curative ratio of DFUs is rarely, and the extreme result is result from complex mechanisms and all kinds of infections. The research of treatment methods on DFUs is focus on surgical debridement intervention and bio-debridement therapy. A super effective intervention has been unrevealed for the limitation of the number and quality of study [6], so the nursing on DFUs becomes a key intervention to help patients with DFUs to keep relative health status. Selected an appropriate dressing is a major point to effective disinfected and removal of the necrotic tissue of ulcers, modify the micro-condition of wounds, and accelerate wounds healing.

Honey dressing has been applied to clinical practice for many types of disease for centuries [7]. As a wound dressing, honey dressing can provide a moist micro-environment with antimicrobial properties, has anti-inflammatory effects, reduces edema and exudates, promotes angiogenesis and granulation tissue formation, induces wound contraction, stimulates collagen synthesis, facilities debridement and accelerates wound epithelialisation [8–12]. In terms of advantages, many researchers have studied the effects of honey dressing for the treatment of DFUs, and these conclusions are uncertainty. So we are tried to objectively evaluate the effectiveness of honey dressing in the treatment of DFUs according to the systematic review of evidence-based medicine based on published literature, and provide an objective suggestion to select an appropriate intervention to patients with DFUs.

2. Materials and methods

2.1. Included and excluded criteria

2.1.1. Study style of article

Randomized controlled trials (RCTs) and the articles of Chinese and English language are eligible our study.

2.1.2. Object of study

Specific diagnostic criteria have been revealed to identify these patients with DFUs. Wagner grade of DFUs is not a limitation of our study. But patients accompanied by other diseases, such as last-stage of cancer and steroid treatment carried out is not eligible.

2.1.3. Interventions of study

Honey dressing is provided into the study group and other interventions were carried out in the control group.

2.1.4. Outcome measure

The outcome measure of interest was total treatment time of wounds, wounds healed the ratio, germ purge ratio in different treatment period and mean time of cleaning out.

2.1.5. Excluded criteria of article

Literature of non-RCTs, animal study, case, review, the idea of specialist, non-honey dressing or combine honey dressing with other medical interventions applied, in-sufficient data, lack of data met our study and do not translate effective sort were ineligible the study.

2.2. Search strategy

We searched 6 electronic databases including PubMed, the Cochrane Library, ISI Web of Science, CNKI (China national knowledge infrastructure), VIP (Chinese periodical full-text databases) and Chinese Wanfang Data using combinations of the terms honey, diabetic foot, diabetic feet, “foot, diabetic”, “feet, diabetic”, “foot ulcer, diabetic” and randomized controlled trials, controlled clinical trials, random* (the symbol is a truncation operator to achieve expended electric searched). The references of included articles were manually searched.

2.3. Data extraction and quality assessment

Searches were carried out and data extracted by two independent searchers (Tian Xu and Li-Juan YI). Each trial identified in the search was evaluated for design, patient eligibility criteria, and outcome measures. Any disagreement between searchers concerning the eligibility of a trial was resolved via consulting a third searcher (Guo-Min Song or Li Ma or Yan Wang). Duplicate studies and records were excluded based on screening of titles and abstracts. All remaining articles were screened in full text.

Quality assessment of these trials included in the study was performed by each searcher according to Cochrane Handbook for Systematic Reviews of Interventions version 5.1.0.

2.4. Statistical analyses

The total treatment time of wounds, wounds healed the ratio, germ purge ratio in different treatment period and mean time of cleaning out were calculated and were compared among participants who were treated with honey dressing and control group. We evaluate homogeneity trials included in I^2 . If I^2 was $\geq 50\%$, the trials were considered to be indicated heterogeneous, a random effects model was conducted, If I^2 was $< 50\%$, the studies were considered to be homogeneous, a fixed effects model was performed. Pooled summary statistics of the differences in the ratio or mean for the individual study are shown. Pooled differences in ratio or means were calculated and a two-sided p value < 0.05 was considered to indicate statistical significance. Moreover, sensitivity analysis was conducted based on the leave-one-out approach. All analyses were performed using Stata meta-analysis software, version 12.0.

3. Results

3.1. Selection of trials

A total of 41 trials were included in the initial literature search and add 1 trail to the searched result, and 3 trials [13–15] that

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