WHAM evidence summary: Topical turmeric for wound healing

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CLINICAL QUESTION

What is the best available evidence for topically applied turmeric products for promoting healing in wounds?

KEYWORDS

Turmeric, curcumin, *curcuma longa*, wounds, wound healing

SUMMARY

Turmeric (*Curcuma longa*) is a spice harvested in India and other Asian countries that has traditionally been used to treat many ailments, including skin conditions. Although it is recognised as having anti-inflammatory, antioxidant and antiseptic effects that are beneficial to the processes of wound healing, to-date the scientific evidence on its use as a topical wound treatment is limited.[1-3] *Level 2* evidence[4] suggested turmeric washes are associated with faster healing of postpartum perineal wounds compared with management with oral antibiotic and nutritional supplements. *Level 2* evidence[5] also suggested that a turmeric-containing herbal oil was as effective as povidone-iodine in achieving improvements in the wound bed (including size and depth). *Level 4* evidence[6-9] reported use of a turmeric paste to reduce signs and symptoms in fungating wounds,[7] a novel turmeric-impregnated dressing to heal acute and chronic wounds,[6] and application of turmeric with a goal of amplifying the benefits of phototherapy for hard-to-heal wounds.[8, 9] All these studies were small and had methodological limitations, providing insufficient support for a graded recommendation.

CLINICAL PRACTICE RECOMMENDATIONS

All recommendations should be applied with consideration to the wound, the person, the health professional and the clinical context.

There is insufficient evidence on the effectiveness of topically applied turmeric products to make a graded recommendation on their use for promoting healing in wounds.

SOURCES OF EVIDENCE

This summary was conducted using methods published by the Joanna Briggs Institute.[10-12] The summary is based on a systematic literature search combining search terms related to turmeric/curcumin/curcuma longa and wounds/wound healing. Studies reporting turmeric for management of non-wound skin conditions (e.g. psoriasis and dermatitis) were excluded. Searches were conducted in the CINAHL, PubMed® and Hinari databases and in the Cochrane Library for evidence conducted in human wounds published up to April 2022 in English. Levels of evidence for intervention studies are reported in Table 1.

Table 1: Levels of evidence for clinical studies

Level 1 Evidence	Level 2 Evidence	Level 3 Evidence	Level 4 Evidence	Level 5 Evidence
Experimental Designs	**Quasi-experimental Designs**	**Observational – Analytic Designs**	**Observational –Descriptive Studies**	**Expert Opinion/ Bench Research**
Nil	Level 2.c Quasi-experimental prospectively controlled study[4, 5]	Nil	Level 4.c Case series[6, 7] Level 4.d Case study[8, 9]	Nil

BACKGROUND

Turmeric (*Curcuma longa*) is a spice prepared from a rhizome, with curcumin being the active chemical substance.[3, 13] It is described as having anti-inflammatory, antioxidant, antiseptic and anti-cancer effects.[1-3] It has been used traditionally to treat skin conditions including psoriasis, redness, erythema and pain and burning from lesions.[14] Laboratory studies have demonstrated the ability of curcumin to enhance wound healing by inhibiting the production of cytokines and influencing free radical behaviour, thereby reducing oxidative stress and inflammatory responses.[2, 3, 13] In animal studies curcumin has been associated with an increase in fibroblast migration, leading to enhanced granulation tissue formation, as well as increased collagen deposition and neovascularisation. In these ways, curcumin appears to influence wound healing at the inflammatory, proliferation and remodelling stages.[3, 13]

As a traditional treatment for wounds in India and other Asian countries, turmeric is prepared for application as a paste or wash. In Asia it has been marketed as an additive in sticking plaster.[15] There is an extensive body of animal-based research exploring its use to enhance the performance of wound dressings, including chitosan, alginate, collagen and polymeric experimental products.[2, 3] However, turmeric is observed to have poor water solubility, low penetration of skin and the active ingredients degrade rapidly, which have thus far limited its commercialisation.[14]

CLINICAL EVIDENCE

The evidence on turmeric products applied topically to human wounds is summarised in Table 2.

Topical turmeric washes for promoting wound healing

One quasi-experiment[4] at moderate risk of bias reported the use of topical turmeric as a cleansing wash for promoting healing of perineal wounds. Postpartum women with grade II perineal wounds were assigned to one of three intervention groups (n = 15 in each group) – 5% concentration turmeric perineal washes twice daily, 10% concentration turmeric perineal washes twice daily or a control group receiving oral antibiotics and nutritional supplements. The treatment duration was five days for all groups. At day 5 and day 7, the turmeric perineal wash groups achieved superior outcomes compared with the control group for measures of perineal healing (redness, oedema, ecchymosis, discharge and approximation using the previously validated REEDA scale). The 5% concentration turmeric wash group had a faster rate of healing on average (5 days postpartum versus 7 days for the 10% concentration turmeric wash group versus >7 days for the control group, $p < 0.05$)[4] (*Level 2*).

Turmeric paste/oil preparations for promoting wound healing

A prospective study[5] (n = 160) at high risk of bias investigated treatment of diabetic foot ulcers over 30 days. Participants received a povidone-iodine dressing or a herbal oil dressing that contained curcumin, neem and coconut oil (prepared by heating the leaves and oils together and then straining and cooling). Evaluation was conducted at baseline, day 15 and day 30 using the Bates-Jensen Wound Assessment Tool (BWAT). Both groups showed statistically significantly better scores on all variables on the BWAT. There was minimal between-group comparison and it was unclear how many ulcers healed during the study,[5] but the herbal oil was reported to be cost effective (*Level 2*).

One case series[7] at high risk of bias explored topical application of turmeric paste to fungating cancerous lesions (n = 111) of the face, breast, skin and miscellaneous anatomical locations. A 0.5% concentration curcumin paste was applied three times daily and no concomitant therapy was used. After four weeks of treatment, 90% of lesions exhibited reduction in malodour, 50% were less painful, 70% had a reduction in exudate and 10% showed reduction in lesion “thickness”. One participant experienced severe adverse allergic reaction[7] (*Level 4*).

Turmeric wound dressings for promoting wound healing

Despite the literature search identifying a large volume of research exploring experimental wound dressings utilising turmeric, only one study was identified that reported clinical outcomes for a turmeric dressing applied to human wounds. In this case series,[6] which was at low risk of bias, outcomes were reported for lower limb acute (n = 9) and hard-to-heal (n = 22) wounds treated with an antioxidant, galactomannan-based

matrix dressing containing curcumin[1] that was applied every three days. The wounds were assessed as infection-free at baseline; however, the participants had significant co-morbidities (e.g., diabetes and venous insufficiency). At 8-week follow-up, 32% of the hard-to-heal wounds and 9% of the acute wounds completely healed. Only 52% of participants completed the treatment period, but withdrawals were not related to the wound dressing[6] (*Level 4*).

Topical turmeric in conjunction with light therapy for promoting wound healing

The literature search identified several case studies[8, 9] at high risk of bias that reported use of topical turmeric with the goal of amplifying the absorption of blue light applied to hard-to-heal wounds. The curcumin-enhanced phototherapy treatment was combined with low level laser therapy and a cellulose dressing. Turmeric is reported to be photosensitive, and in these case studies it was applied as an emulsion across the surface of the wound immediately prior to phototherapy to increase the efficacy of the light therapy. In one case study[9] an association between curcumin-enhanced phototherapy and reduction in microorganisms in a Category/Grade 3 pressure injury/ulcer, as well as total healing in 30 days, were reported. In other case studies[8] in which the same combination therapy was used, five full thickness pressure injuries/ulcers healed in 20-30 weeks (excepting one that was not healed by 45 weeks of treatment) (*Level 4*).

CONFLICTS OF INTEREST

The author declares no conflicts of interest in accordance with International Committee of Medical Journal Editors (ICMJE) standards.

ABOUT WHAM EVIDENCE SUMMARIES

WHAM evidence summaries are consistent with methodology published in

Munn Z, Lockwood C, Moola S. The development and use of evidence summaries for point of care information systems: A streamlined rapid review approach, Worldviews Evid Based Nurs. 2015;12(3):131-8.

Methods are outlined in resources published by the Joanna Briggs Institute[10-12] and on the WHAM Collaborative website: http://WHAMwounds.com.

WHAM evidence summaries undergo peer-review by an international, multidisciplinary Expert Reference Group. WHAM evidence summaries provide a summary of the best available evidence on specific topics and make suggestions that can be used to inform clinical practice. Evidence contained within this summary should be evaluated by appropriately trained professionals with expertise in wound prevention and management, and the evidence should be considered in the context of the individual, the professional, the clinical setting and other relevant clinical information.

PUBLICATION

This evidence summary has been published in:

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[1] REOXCARE by Histocell, study conducted in Spain

Table 2: Summary of the evidence for papaya-based treatments

Study	Type of topical turmeric (number participants)	Comparison treatment (number participants)	Type of wounds	Duration of treatment	Outcome measures	Level of evidence
Mutia et. al. (2021)[4]	• Turmeric washes 5% concentration (n = 15) • Turmeric washes 10% concentration (n = 15)	Oral antibiotics and nutritional supplements (n = 15)	Postpartum perineal wounds	5 days	REEDA (Redness, Oedema, Ecchymosis, Discharge, Approximation) score[16]	Level 2
Jeya Mary et. al. (2017)[4]	Herbal oil containing turmeric (n=80)	Povidone-iodine	Diabetic foot ulcers	30 days	Bates-Jensen Wound Assessment Tool (BWAT)[17]	Level 2
Kuttan et. al. (1987)[7]	Topical turmeric paste (n = 111)	None	Fungating cancer lesions	4 weeks	• Wound odour • Wound exudate • Lesion thickness • Pain	Level 4
Castro et.al. (2017)[6]	Antioxidant dressing containing curcumin (n = 31)	None	Venous leg ulcers, diabetic foot ulcers, trauma ulcers and surgical wound dehiscence	8 weeks	RESVECH (Results Expected from Chronic Wound Healing Assessment) 2.0 score[18]	Level 4
Rosa et. al. (2017, 2021)[8, 9]	1.5% turmeric emulsion in combination with blue light phototherapy (n = 4)	None	Full thickness pressure injuries/ulcers	One or two applications in total	Complete healing	Level 4

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