Cochrane Wounds Group Reviews and Review Updates

EDITOR:

Gill Rizzello, Managing editor Cochrane Wounds, School of Nursing, Midwifery and Social Work, University of Manchester

Correspondence: gill.rizzello@manchester.ac.uk · More information: www.wounds.cochrane.org

Conflicts of Interest: None

Publication in The Cochrane Library, Issue 7, 2021

Compression bandages or s tockings versus no compression for treating venous leg ulcers

Chunhu Shi, Jo C Dumville, Nicky Cullum, Emma Connaughton, Gill Norman

Citation example: Shi C, Dumville JC, Cullum N, Connaughton E, Norman G.
Compression bandages or stockings versus no compression for treating venous leg ulcers.
Cochrane Database of Systematic Reviews 2021, Issue 7.
Art. No.: CD013397.
DOI: 10.1002/14651858.CD013397.pub2.

ABSTRACT

Background

Leg ulcers are open skin wounds on the lower leg that can last weeks, months or even years. Most leg ulcers are the result of venous diseases. First-line treatment options often include the use of compression bandages or stockings.

Objectives

To assess the effects of using compression bandages or stockings, compared with no compression, on the healing of venous leg ulcers in any setting and population.

Search methods

In June 2020 we searched the Cochrane Wounds Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL), Ovid MEDLINE (including In-Process & Other Non-Indexed Citations), Ovid Embase and EBSCO CINAHL Plus. We also searched clinical trials registries for ongoing and unpublished studies, and scanned reference lists of relevant included studies as well as reviews, meta-analyses and health technology reports to identify additional studies. There were no restrictions by language, date of publication or study setting.

Selection criteria

We included randomised controlled trials that compared any types of compression bandages or stockings with no compression in participants with venous leg ulcers in any setting.

Data collection and analysis

At least two review authors independently assessed studies using predetermined inclusion criteria. We carried out data extraction, and risk-of-bias assessment using the Cochrane risk-of-bias tool. We assessed the certainty of the evidence according to GRADE methodology.

Main results

We included 14 studies (1391 participants) in the review. Most studies were small (median study sample size: 51 participants). Participants were recruited from acute-care settings, outpatient settings and community settings, and a large proportion (65.9%; 917/1391) of participants had a confirmed history or clinical evidence of chronic venous disease, a confirmed cause of chronic venous insufficiency, or an ankle pressure/brachial pressure ratio of greater than 0.8 or 0.9. The average age of participants ranged from 58.0 to 76.5 years (median: 70.1 years). The average duration of their leg ulcers ranged from 9.0 weeks to 31.6 months (median: 22.0 months), and a large proportion of participants (64.8%; 901/1391) had ulcers with an area between 5 and 20 cm2. Studies had a median follow-up of 12 weeks. Compression bandages or stockings applied included short-stretch bandage, four-layer compression bandage, and Unna's boot (a type of inelastic gauze bandage impregnated with zinc oxide), and comparator groups used included 'usual care', pharmacological treatment, a variety of dressings, and a variety of treatments where some participants received compression (but it was not the norm). Of the 14 included studies, 10 (71.4%) presented findings which we consider to be at high overall risk of bias.

Primary outcomes

There is moderate-certainty evidence (downgraded once for risk of bias) (1) that there is probably a shorter time to complete healing of venous leg ulcers in people wearing compression bandages or stockings compared with those not wearing compression (pooled hazard ratio for time-to-complete healing 2.17, 95% confidence interval (CI) 1.52 to 3.10; I2 = 59%; 5 studies, 733 participants); and (2) that people treated using compression bandages or stockings are more likely to experience complete ulcer healing within 12 months compared with people with no compression (10 studies, 1215 participants): risk ratio for complete healing 1.77, 95% CI 1.41 to 2.21; I2 = 65% (8 studies with analysable data, 1120 participants); synthesis without meta-analysis suggests more completely-healed ulcers in compression bandages or stockings than in no compression (2 studies without analysable data, 95 participants).

It is uncertain whether there is any difference in rates of adverse events between using compression bandages or stockings and no compression (very low-certainty evidence; 3 studies, 585 participants).

Secondary outcomes

Moderate-certainty evidence suggests that people using compression bandages or stockings probably have a lower mean pain score than those not using compression (four studies with 859 participants and another study with 69 ulcers): pooled mean difference −1.39, 95% CI −1.79 to −0.98; I2 = 65% (two studies with 426 participants and another study with 69 ulcers having analysable data); synthesis without meta-analysis suggests a reduction in leg ulcer pain in compression bandages or stockings, compared with no compression (two studies without analysable data, 433 participants). Compression bandages or stockings versus no compression may improve disease-specific quality of life, but not all aspects of general health status during the follow-up of 12 weeks to 12 months (four studies with 859 participants; low-certainty evidence).

It is uncertain if the use of compression bandages or stockings is more cost-effective than not using them (three studies with 486 participants; very low-certainty evidence).

Authors' conclusions

If using compression bandages or stockings, people with venous leg ulcers probably experience complete wound healing more quickly, and more people have wounds completely healed. The use of compression bandages or stockings probably reduces pain and may improve disease-specific quality of life. There is uncertainty about adverse effects, and cost effectiveness.

Future research should focus on comparing alternative bandages and stockings with the primary endpoint of time to complete wound healing alongside adverse events including pain score, and health-related quality of life, and should incorporate cost-effectiveness analysis where possible. Future studies should adhere to international standards of trial conduct and reporting.

Plain language summary

Compression bandages or stockings versus no compression for treating venous leg ulcers

Key messages

Compared with not using compression, compression therapy that uses bandages or stockings to treat venous leg ulcers:

- probably heals venous leg ulcers more quickly;
- probably increases the number of people whose ulcer has completely healed after 12 months;
- probably reduces pain; and
- may improve some aspects of people's quality of life.

However, there is still uncertainty about whether or not compression therapy causes unwanted side effects, and if the health benefits of using compression outweigh its cost.

What are leg ulcers?

Leg ulcers are open skin wounds on the lower leg that can last weeks, months or even years. Most leg ulcers are caused by venous diseases that affect the circulation of blood in leg veins. Venous leg ulcers can cause distress and pain to patients, and can be very costly to the health service.

What did we want to find out?

Standard treatment options for venous leg ulcers often include compression therapy. This involves applying external pressure around the lower leg to help the return of blood from the legs to the heart. Compression therapy uses bandages, stockings or other devices.

We wanted to find out if compression therapy delivered by bandages and stockings compared with no compression:

- heals venous leg ulcers;
- has any unwanted effects;
- improves people's quality of life;
- has health benefits that outweigh the costs (cost-effectiveness); and
- reduces pain.

What did we do?

We searched for randomised controlled trials (clinical studies where the treatment or care people receive is chosen at random). This type of study design provides the most reliable health evidence about the effects of a treatment. We searched for studies that evaluated the effects of any types of compression bandages or stockings compared with no compression in people affected with venous leg ulcers in any care setting. We compared and

summarised their results, and rated our confidence in the evidence, based on factors such as study methods and sizes.

What did we find?

We found 14 studies (1391 people, average age: 70.1 years) that lasted on average for 12 weeks. People in eight of the 14 studies were treated in outpatient and community settings. People had venous leg ulcers that had lasted for 22 months on average, and most ulcers had an area between 5 and 20 cm2.

The studies used three types of compression therapy: short-stretch bandage, four-layer compression bandage, and Unna's boot (a type of compression bandage containing zinc oxide). These therapies were compared with no compression in forms of 'usual care', pharmacological treatment, a variety of dressings, and a variety of treatments where only some participants received compression (but it was not the norm).

(1) Venous leg-ulcer healing and unwanted effects

Compared with no compression, the evidence suggests that:

- people wearing compression bandages or stockings probably experience complete ulcer healing more quickly; and
- more people treated using the compression bandages or stockings are likely to experience complete ulcer healing within 12 months.

However, we did not find clear evidence to tell if using compression bandages or stockings causes any unwanted effects.

(2) Other effects

The evidence suggests that, compared with not using compression, the use of compression bandages or stockings:

- probably reduces pain more than not using compression; and
- may improve some aspects of people's quality of life in 12 weeks to 12 months.

However, we are uncertain if the use of compression bandages or stockings results in health benefits that outweigh their costs.

What limited our confidence in the evidence?

Most studies were small (51 people on average) and 10 of the 14 included studies used methods that could introduce errors in their results.

How up-to-date is this review?

The evidence in this Cochrane Review is current to June 2020.

Publication in The Cochrane Library, Issue 8, 2021

Beds, overlays and mattresses for preventing and treating pressure ulcers: an overview of Cochrane Reviews and network meta-analysis

Chunhu Shi, Jo C Dumville, Nicky Cullum, Sarah Rhodes, Elizabeth McInnes, En Lin Goh, Gill Norman

Citation example: Shi C, Dumville JC, Cullum N, Rhodes S, McInnes E, Goh EL, Norman G.
Beds, overlays and mattresses for preventing and treating pressure ulcers: an overview of Cochrane Reviews and network meta-analysis.
Cochrane Database of Systematic Reviews 2021, Issue 8.
Art. No.: CD013761.
DOI: 10.1002/14651858.CD013761.pub2.

ABSTRACT

Background

Pressure ulcers (also known as pressure injuries, pressure sores and bed sores) are localised injuries to the skin or underlying soft tissue, or both, caused by unrelieved pressure, shear or friction. Specific kinds of beds, overlays and mattresses are widely used with the aim of preventing and treating pressure ulcers.

Objectives

To summarise evidence from Cochrane Reviews that assess the effects of beds, overlays and mattresses on reducing the incidence of pressure ulcers and on increasing pressure ulcer healing in any setting and population.

To assess the relative effects of different types of beds, overlays and mattresses for reducing the incidence of pressure ulcers and increasing pressure ulcer healing in any setting and population.

To cumulatively rank the different treatment options of beds, overlays and mattresses in order of their effectiveness in pressure ulcer prevention and treatment.

Methods

In July 2020, we searched the Cochrane Library. Cochrane Reviews reporting the effectiveness of beds, mattresses or overlays for preventing or treating pressure ulcers were eligible for inclusion in this overview. Two review authors independently screened search results and undertook data extraction and risk of bias assessment using the ROBIS tool. We summarised the reported evidence in an overview of reviews. Where possible, we included the randomised controlled trials from each included review in network meta-analyses. We assessed the relative effectiveness of beds, overlays and mattresses for preventing or treating pressure ulcers and their probabilities of being, comparably, the most effective treat-

ment. We assessed the certainty of the evidence using the GRADE approach.

Main results

We include six Cochrane Reviews in this overview of reviews, all at low or unclear risk of bias.

Pressure ulcer prevention: four reviews (of 68 studies with 18,174 participants) report direct evidence for 27 pairwise comparisons between 12 types of support surface on the following outcomes: pressure ulcer incidence, time to pressure ulcer incidence, patient comfort response, adverse event rates, health-related quality of life, and cost-effectiveness. Here we focus on outcomes with some evidence at a minimum of low certainty.

(1) Pressure ulcer incidence: our overview includes direct evidence for 27 comparisons that mostly (19/27) have very low-certainty evidence concerning reduction of pressure ulcer risk. We included 40 studies (12,517 participants; 1298 participants with new ulcers) in a network meta-analysis involving 13 types of intervention. Data informing the network are sparse and this, together with the high risk of bias in most studies informing the network, means most network contrasts (64/78) yield evidence of very low certainty. There is low-certainty evidence that, compared with foam surfaces (reference treatment), reactive air surfaces (e.g. static air overlays) (risk ratio (RR) 0.46, 95% confidence interval (CI) 0.29 to 0.75), alternating pressure (active) air surfaces (e.g. alternating pressure air mattresses, large-celled ripple mattresses) (RR 0.63, 95% CI 0.42 to 0.93), and reactive gel surfaces (e.g. gel pads used on operating tables) (RR 0.47, 95% CI 0.22 to 1.01) may reduce pressure ulcer incidence. The ranking of treatments in terms of effectiveness is also of very low certainty for all interventions. It is unclear which treatment is best for preventing ulceration.

(2) Time to pressure ulcer incidence: four reviews had direct evidence on this outcome for seven comparisons. We included 10 studies (7211 participants; 699 participants with new ulcers) evaluating six interventions in a network meta-analysis. Again, data from most network contrasts (13/15) are of very low certainty. There is low-certainty evidence that, compared with foam surfaces (reference treatment), reactive air surfaces may reduce the hazard of developing new pressure ulcers (hazard ratio (HR) 0.20, 95% CI 0.04 to 1.05). The ranking of all support surfaces for preventing pressure ulcers in terms of time to healing is uncertain.

(3) Cost-effectiveness: this overview includes direct evidence for three comparisons. For preventing pressure ulcers, alternating pressure air surfaces are probably more cost-effective than foam surfaces (moderate-certainty evidence).

Pressure ulcer treatment: two reviews (of 12 studies with 972 participants) report direct evidence for five comparisons on: complete pressure ulcer healing, time to complete pressure ulcer healing, patient comfort response, adverse event rates, and cost-effectiveness. Here we focus on outcomes with some evidence at a minimum of low certainty.

(1) Complete pressure ulcer healing: our overview includes direct evidence for five comparisons. There is uncertainty about the relative effects of beds, overlays and mattresses on ulcer healing. The corresponding network meta-analysis (with four studies, 397 participants) had only three direct contrasts and a total of six network contrasts. Again, most network contrasts (5/6) have very low-certainty evidence. There was low-certainty evidence that more people with pressure ulcers may heal completely using reactive air surfaces than using foam surfaces (RR 1.32, 95% CI 0.96 to 1.80). We are uncertain which surfaces have the highest probability of being the most effective (all very low-certainty evidence).

(2) Time to complete pressure ulcer healing: this overview includes direct evidence for one comparison: people using reactive air surfaces may be more likely to have healed pressure ulcers compared with those using foam surfaces in long-term care settings (HR 2.66, 95% CI 1.34 to 5.17; low-certainty evidence).

(3) Cost-effectiveness: this overview includes direct evidence for one comparison: compared with foam surfaces, reactive air surfaces may cost an extra 26 US dollars for every ulcer-free day in the first year of use in long-term care settings (low-certainty evidence).

Authors' conclusions

Compared with foam surfaces, reactive air surfaces may reduce pressure ulcer risk and may increase complete ulcer healing. Compared with foam surfaces, alternating pressure air surfaces may reduce pressure ulcer risk and are probably more cost-effective in preventing pressure ulcers. Compared with foam surfaces, reactive gel surfaces may reduce pressure ulcer risk, particularly for people in operating rooms and long-term care settings. There are uncertainties for the relative effectiveness of other support surfaces for preventing and treating pressure ulcers, and their efficacy ranking.

More high-quality research is required; for example, for the comparison of reactive air surfaces with alternating pressure air surfaces. Future studies should consider time-to-event outcomes and be designed to minimise any risk of bias.

Plain language summary

What are the benefits and risks of beds, mattresses and overlays for preventing and treating pressure ulcers?

The overview presents a lot of data from randomised ▶

controlled trials and contains an advanced analysis called 'network meta-analysis'. The analysis allows comparisons of all types of support surfaces for preventing or treating pressure ulcers. This interactive tool may help with navigation of the data https://stopthepressure.shinyapps.io/Cochrane_support_surface_reviews/

Key messages

Static air mattresses or overlays, alternating pressure air mattresses or overlays, and gel pads used on operating tables may be better than foam mattresses for preventing pressure ulcers.

Compared with foam mattresses, alternating pressure air mattresses or overlays probably result in health benefits that outweigh their costs in preventing pressure ulcers. Static air mattresses or overlays may be better than foam mattresses for ulcer healing, but may cost more.

It is unclear what the best treatment is for either preventing or treating pressure ulcers; what the effects of these treatment options are on people's comfort and quality of life; and whether or not there are any unwanted effects.

What are pressure ulcers?

Pressure ulcers (also known as pressure sores or bed sores) are wounds to the skin and underlying tissue caused by prolonged pressure or rubbing. People who have mobility problems or who lie in bed for long periods are at risk of developing pressure ulcers.

What did we want to find out?

There are many types of beds, mattresses and overlays specifically designed for people with pressure ulcers. These can be made from a range of materials (such as foam, air cells and gel pads) and are divided into two groups:

- reactive (static) surfaces that apply a constant pressure to the skin; and
- active (alternating pressure) surfaces that regularly redistribute the pressure under the body.

We wanted to find out if different types of reactive and active surfaces:

- prevent pressure ulcers;
- help ulcers to heal;
- are comfortable and improve people's quality of life;
- have health benefits that outweigh their costs; and
- have any unwanted effects.

We also wanted to find out what the best treatment options are for either preventing or healing pressure ulcers.

What did we do?

We searched for Cochrane Reviews that summarised the results of all available carefully designed studies (controlled trials) evaluating different beds, mattresses and overlays in preventing and treating pressure ulcers. A Cochrane Review provides a high level of evidence on the effectiveness of healthcare interventions. We summarised the results of these reviews in a single document (called an overview of reviews).

We also collected studies included in these reviews and compared all available treatments at the same time in a single analysis (called network meta-analysis). We then summarised these results, and rated our confidence in the evidence, based on factors such as study methods and sizes.

What did we find?

Effects in preventing pressure ulcers

We found four reviews on the use of beds, mattresses and overlays for preventing pressure ulcers. From these, we included 40 studies (12,517 people) in a network meta-analysis evaluating reduction of pressure ulcer risk. The network meta-analysis evidence suggests that static (reactive) air overlays, alternating pressure air mattresses, and (reactive) gel pads used on operating tables may reduce pressure ulcer risk compared with foam mattresses.

We also included 10 studies (7211 people) in a network meta-analysis evaluating the time taken for new ulcers to develop. The network meta-analysis evidence suggests that reactive air surfaces may reduce the chances of developing new ulcers compared with foam surfaces.

Effects in treating pressure ulcers

We found two reviews on pressure ulcer healing. From these, we included four studies (397 people) in a network meta-analysis. The network meta-analysis evidence suggests that more people with ulcers may heal completely using reactive air surfaces than foam surfaces.

The overview evidence suggests that, if the time needed to completely heal an ulcer is looked at, reactive air surfaces may improve the chances of pressure ulcers healing when compared with foam mattresses.

However, it is unclear which treatment is best for either preventing or treating pressure ulcers.

Other effects in preventing and treating pressure ulcers
The overview evidence suggests that:

- compared with foam mattresses, alternating pressure air surfaces probably result in health benefits that out weigh their costs in preventing pressure ulcers;

- reactive air-filled surfaces may cost more than foam mattresses in healing ulcers; and

- the other benefits and risks of these beds, mattresses and mattress overlays are unclear.

What are the limitations of the evidence?

Although the reviews we found used reliable methods, most of the studies in them were small and used methods likely to introduce errors in their results.

How up-to-date is this evidence?

The evidence in this overview is current to July 2020.

Publication in The Cochrane Library, Issue 8, 2021

Preoperative hair removal to reduce surgical site infection

Judith Tanner, Kate Melen

Citation example: Tanner J, Melen K.

Preoperative hair removal to reduce surgical site infection.
Cochrane Database of Systematic Reviews 2021, Issue 8.
Art. No.: CD004122.
DOI: 10.1002/14651858.CD004122.pub5.

ABSTRACT

Background

Hair has traditionally been removed from the surgical site before surgery; however, some studies claim that this increases surgical site infections (SSIs) and should be avoided. This is the second update of a review published in 2006 and first updated in 2011.

Objectives

To determine whether routine preoperative hair removal (compared with no removal) and the method, timing, or setting of hair removal effect SSI rates.

Search methods

In November 2019, for this second update we searched the Cochrane Wounds Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL) (the Cochrane Library); Ovid MEDLINE (including In-Process & Other Non-Indexed Citations); Ovid Embase; and EBSCO CINAHL Plus. We also searched clinical trial registries for ongoing and unpublished studies, and scanned the reference lists of included studies plus reviews to identify additional studies. We applied no date or language restrictions.

Selection criteria

We included randomised controlled trials or quasi-randomised trials that compared:

- hair removal with no hair removal;

- different methods of hair removal; and

- hair removal at different times before surgery.

Data collection and analysis

Two review authors independently assessed the relevance of each study. Data were extracted independently by both review authors and cross-checked. We carried out 'Risk of bias' assessment using the Cochrane 'Risk of bias' tool and assessed the certainty of evidence according to GRADE. Sensitivity analyses excluding studies at high risk of bias were conducted.

Main results

We included 11 new studies in this update resulting in a total of 19 randomised and 6 quasi-randomised trials (8919 participants).

Clipping compared with no hair removal

Low certainty evidence suggests there may be little difference in risk of SSI when no hair removal is compared with hair removal using clippers (risk ratio (RR) 0.95, 95% confidence interval (CI) 0.65 to 1.39; three studies with 1733 participants).

Shaving with a razor compared with no hair removal

Moderate certainty evidence suggests the risk of SSI is probably increased in participants who have hair removal with a razor compared with no removal (RR 1.82, 95% CI 1.05 to 3.14; seven studies with 1706 participants). In terms of absolute risk this represents 17 more SSIs per 1000 in the razor group compared with the no hair removal group (95% CI 1 more to 45 more SSI in the razor group).

Based on low-certainty evidence, it is unclear whether there is a difference in stitch abscesses between hair removal with a razor and no hair removal (1 trial with 80 participants; RR 1.00, 95% CI 0.21 to 4.66).

Based on narrative data from one trial with 136 participants, there may be little difference in length of hospital stay between participants having hair removed with a razor compared with those having no hair removal (low-certainty evidence).

Based on narrative data from one trial with 278 participants, it is uncertain whether there is a difference in cost between participants having hair removed by shaving with a razor compared with no hair removal (very low certainty evidence).

Depilatory cream compared with no hair removal

Low certainty evidence suggests there may be little difference in SSI risk between depilatory cream or no hair removal, although there are were wide confidence intervals around the point estimate that included benefit and harm (RR 1.02, 95% CI 0.45 to 2.31; low-certainty evidence; 1 trial with 267 participants).

Based on narrative data from one trial with 267 participants, it is uncertain whether there is a difference in cost between participants having hair removed with depilatory cream compared with no hair removal (very low certainty evidence).

Shaving with a razor compared with clipping

Moderate-certainty evidence from 7 studies with 3723 participants suggests the risk of SSI is probably increased by shaving with a razor compared with clipping (RR 1.64, 95% CI 1.16 to 2.33).

Moderate-certainty evidence suggests the risk of skin injury is probably increased in people who have hair removal with a razor rather than clipping (3 trials with 1333 participants; RR 1.74, CI 95% 1.12 to 2.71).

Shaving with a razor compared with depilatory cream

Moderate-certainty evidence from 9 studies with 1593 participants suggests there is probably more SSI risk when razors are used compared with depilatory cream (RR 2.28, 95% CI 1.12 to 4.65).

Low-certainty evidence suggests the risk of skin injury may be increased when using a razor rather than depilatory cream for hair removal (RR 6.95, CI 95% 3.45 to 13.98; 5 trials with 937 participants).

Based on narrative data from three trials with 402 participants, it is uncertain whether depilatory cream is more expensive than shaving (very low certainty evidence).

Hair removal on the day of surgery compared with one-day preoperatively

Low-certainty evidence suggests that there may be a small reduction in SSI risk when hair is removed on the day of surgery compared with the day before surgery although there are were wide confidence intervals around the point estimate that included benefit and harm (one trial, 977 participants; RR 0.83, 95% CI 0.54 to 1.30).

Authors' conclusions

Compared with no hair removal, there may be little difference in risk of SSI when clippers or depilatory cream are used (low-certainty evidence). However, there are probably fewer SSIs when hair is not removed compared with shaving with a razor (moderate-certainty evidence). If hair has to be removed, moderate-certainty evidence suggests using clippers or depilatory cream probably results in fewer SSIs and other complications compared with shaving using a razor. There may be a small reduction in SSIs when hair is removed on the day of, rather than the day before, surgery.

Plain language summary

Does hair removal before surgery prevent infections after surgery?

Key messages?

Compared with no hair removal:

- there are probably more surgical site infections when hair is removed by shaving with a razor;
- removing hair with clippers and cream may make little to no difference to the number of infections;

Clippers and hair removal cream probably cause fewer infections than shaving using a razor.

Removing hair on the day of, rather than the day before surgery may slightly reduce the number of infections.

Why is hair removed before surgery?

Before a surgical intervention, it is common to remove hair from the area of the body that is going to have surgery. Hair can be removed using different methods, including clippers, a razor, or hair removal cream.

Hair is removed to avoid problems during and after surgery, for example when stitching up wounds or applying dressings. However, some studies claim that removing hair could cause infections after surgery and should be avoided.

What did we want to find out?

We wanted to find out if removing hair before surgery:

- causes or prevents infections;
- prevents wound complications, such as cuts to the skin or the opening up of stitched wounds;
- has an impact on how long people stay in hospital after surgery; and
- has any cost implications.

We were also interested in whether some hair removal methods or times for hair removal are better than others.

What did we do?

First, we searched for studies that compared:

- hair removal against no removal; or
- different methods and times of hair removal.

We then compared the results and summarised the evidence from all the studies. Finally, we rated our confidence in the evidence, based on factors such as study methods and sizes.

What did we find?

We found 25 studies that involved a total of 8919 people.

Ten studies compared no hair removal against hair removal, using:

- clippers (3 studies);
- shaving with a razor (8 studies, 7 of which provided useable evidence); or
- hair removal cream (1 study).

Seven studies compared using a razor against using clippers, and 10 studies compared using a razor against using cream (nine of these 10 studies provided useable evidence).

One study compared hair removal the day before surgery versus hair removal on the day of surgery.

What does the evidence show?

Hair removal compared to no hair removal

- Hair removal with clippers and cream may make little to no difference to the number of surgical site infections.
- Hair removal with a razor probably risks more infections than no hair removal.

Whether hair is removed with a razor or not removed may make little to no difference for length of hospital stay (1 study).

Comparisons of different hair removal methods

- Clippers probably cause fewer infections and skin injuries than razors.
- Cream probably causes fewer infections, and may cause fewer skin injuries, than razors.

Time of hair removal

Whether hair is removed on the day of surgery or the day before surgery may slightly reduce infection numbers (1 study).

What do we still not know?

Due to a lack of robust studies, we do not know:

- if removing hair affects wound complications and costs when compared to not removing hair;
- if different hair removal methods have different effects on length of hospital stay, or on costs; and
- if the time of hair removal affects wound complications, length of hospital stay, or costs.

How up-to-date is this review?

The evidence in this Cochrane Review is current to November 2019.

Publication in The Cochrane Library, Issue 9, 2021

Silicone gel sheeting for treating hypertrophic scars

Qingling Jiang, Junjie Chen, Fan Tian, Zhenmi Liu

Citation example: Jiang Q, Chen J, Tian F, Liu Z.

Silicone gel sheeting for treating hypertrophic scars. *Cochrane Database of Systematic Reviews 2021*, Issue 9. Art. No.: CD013357.
DOI: 10.1002/14651858.CD013357.pub2.

ABSTRACT

Background

Each year, in high-income countries alone, approximately 100 million people develop scars. Excessive scarring can cause pruritus, pain, contractures, and cosmetic disfigurement, and can dramatically affect people's quality of life, both physically and psychologically. Hypertrophic scars are visible and elevated scars that do not spread into surrounding tissues and that often regress spontaneously. Silicone gel sheeting (SGS) is made from medical-grade silicone reinforced with a silicone membrane backing and is one of the most commonly used treatments for hypertrophic scars.

Objectives

To assess the effects of silicone gel sheeting for the treatment of hypertrophic scars in any care setting.

Search methods

In April 2021 we searched the Cochrane Wounds Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL); Ovid MEDLINE (including In-Process & Other Non-Indexed Citations); Ovid Embase and EBSCO CINAHL Plus. We also searched clinical trials registries for ongoing and unpublished studies, and scanned reference lists of relevant included studies as well as reviews, meta-analyses and health technology reports to identify additional studies. There were no restrictions with respect to language, date of publication or study setting.

Selection criteria

We included randomised controlled trials (RCTs) that

enrolled people with any hypertrophic scars and assessed the use of SGS.

Data collection and analysis

Two review authors independently performed study selection, 'Risk of bias' assessment, data extraction and GRADE assessment of the certainty of evidence. We resolved initial disagreements by discussion, or by consulting a third review author when necessary.

Main results

Thirteen studies met the inclusion criteria. Study sample sizes ranged from 10 to 60 participants. The trials were clinically heterogeneous with differences in duration of follow-up, and scar site. We report 10 comparisons, SGS compared with no SGS treatment and SGS compared with the following treatments: pressure garments; silicone gel; topical onion extract; polyurethane; propylene glycol and hydroxyethyl cellulose sheeting; Kenalog injection; flashlamp-pumped pulsed-dye laser; intense pulsed light and Gecko Nanoplast (a silicone gel bandage). Six trials had a split-site design and three trials had an unclear design (resulting in a mix of paired and clustered data).

Included studies reported limited outcome data for the primary review outcomes of severity of scarring measured by health professionals and adverse events (limited data reported by some included studies, but further analyses of these data was not possible) and no data were reported for severity of scarring reported by patients. For secondary outcomes some pain data were reported, but health-related quality of life and cost effectiveness were not reported. Many trials had poorly-reported methodology, meaning the risk of bias was unclear. We rated all evidence as being either of low or very low certainty, often because of imprecision resulting from few participants, low event rates, or both, all in single studies.

SGS compared with no SGS

Seven studies with 177 participants compared SGS with no SGS for hypertrophic scars. Two studies with 31 participants (32 scars) reported severity of scarring assessed by health professionals, and it is uncertain whether there is a difference in severity of scarring between the two groups (mean difference (MD) -1.83, 95% confidence interval (CI) -3.77 to 0.12; very low-certainty evidence, downgraded once for risk of bias, and twice for serious imprecision). One study with 34 participants suggests SGS may result in a slight reduction in pain level compared with no SGS treatment (MD –1.26, 95% CI –2.26 to –0.26; low-certainty evidence, downgraded once for risk of bias and once for imprecision).

SGS compared with pressure garments

One study with 54 participants was included in this comparison. The study reported that SGS may reduce pain levels compared with pressure garments (MD –1.90, 95% CI –2.99 to –0.81; low-certainty evidence, downgraded once for risk of bias and once for imprecision).

SGS compared with silicone gel

One study with 32 participants was included in this comparison. It is unclear if SGS impacts on severity of scarring assessed by health professionals compared with silicone gel (MD 0.40, 95% CI –0.88 to 1.68; very low-certainty evidence, downgraded once for risk of bias, twice for imprecision).

SGS compared with topical onion extract

One trial (32 participants) was included in this comparison. SGS may slightly reduce severity of scarring compared with topical onion extract (MD -1.30, 95% CI -2.58 to -0.02; low-certainty evidence, downgraded once for risk of bias, and once for imprecision).

SGS compared with polyurethane

One study with 60 participants was included in this comparison. It is unclear if SGS impacts on the severity of scarring assessed by health professionals compared with polyurethane (MD 0.50, 95% CI -2.96 to 3.96; very low-certainty evidence, downgraded once for risk of bias, and twice for imprecision).

SGS compared with self-adhesive propylene glycol and hydroxyethyl cellulose sheeting

One study with 38 participants was included in this comparison. It is uncertain if SGS reduces pain compared with self-adhesive propylene glycol and hydroxyethyl cellulose sheeting (MD –0.12, 95% CI –0.18 to –0.06). This is very low-certainty evidence, downgraded once for risk of bias, once for imprecision and once for indirectness.

SGS compared with Gecko Nanoplast

One study with 60 participants was included in this comparison. It is unclear if SGS impacts on pain compared with Gecko Nanoplast (MD 0.70, 95% CI -0.28 to 1.68; very low-certainty evidence, downgraded once for risk of bias and twice for imprecision.

There was a lack of reportable data from the other three comparisons of SGS with Kenalog injection, flashlamp-pumped pulsed-dye laser or intense pulsed light.

Authors' conclusions

There is currently limited rigorous RCT evidence available about the clinical effectiveness of SGS in the treatment of hypertrophic scars. None of the included studies provided evidence on severity of scarring validated by participants, health-related quality of life, or cost effectiveness. Reporting was poor, to the extent that we are not confident that most trials are free from risk of bias. The limitations in current RCT evidence suggest that further trials are required to reduce uncertainty around decision-making in the use of SGS to treat hypertrophic scars.

Plain language summary

Silicone gel sheeting for treating hypertrophic scars

Background

A scar is a mark left on the skin after a wound or injury has healed, for example, after surgery or after a burn. Most scars will fade and become paler over time, but some scars may become red and raised (called hypertrophic scars). Hypertrophic scars may take several years to flatten and fade.

Scars can be itchy, painful or unsightly, and may restrict movement. Scarring can affect people physically and emotionally, and can affect a person's well-being.

Treatments aim to improve a scar's appearance and help to make it less visible. They include: wearing clothing that fits tightly around the skin (pressure garments); treatments applied to the scar; laser therapy and silicone gel sheets.

Silicone gel sheets are soft wound dressings containing an elastic form of silicone. They have a soft, rubbery texture and stick to the skin. They are commonly used on healing skin to help soften and flatten a hypertrophic scar.

What did we want to find out?

In this Cochrane Review, we wanted to find out how well silicone gel sheets worked in treating hypertrophic scars.

Our methods

We searched for studies that investigated the use of silicone gel sheets to treat hypertrophic scars. We searched for randomised controlled trials only, in which the treatment each person receives is chosen at random. These studies give the most reliable evidence about the effects of a treatment.

What we found

We found 13 studies with 468 people (425 of them completed the study) with hypertrophic scars caused by surgery, injury, burns or scalding. The studies compared the effects of silicone gel sheets with: giving no treatment with silicone gel sheets; wearing pressure garments; applying silicone gel or onion extract; polyurethane dressings; steroid injections; laser therapy; intense pulsed light or Gecko Nanoplast (a silicone gel bandage).

All studies were conducted in hospitals, in Europe (6 studies), China (2), the USA (1), Canada (1), Iran (1), Turkey (1) and India (1). They lasted for different lengths of time: from 3 months to 12 months.

Four studies reported assessments of scars by healthcare professionals in way that was usable for this review. No studies reported useful results for the person's own assessment of their scar after treatment.

No studies reported useful results for people's well-being (quality of life): for whether people stayed on the treatment (adherence), whether the treatments had any unwanted effects; or whether the treatments were cost-effective (the benefits of treatment outweighed any extra costs).

The studies did not give enough information to compare silicone gel sheets with steroid injections, laser therapy or pulsed light.

What are the main results of our review?

Silicone gel sheets may slightly improve the appearance of hypertrophic scars compared with onion extract. We are uncertain whether silicone gel sheets improve a scar's appearance better than no treatment with silicone gel sheets, or silicone gel, or polyurethane.

Silicone gel sheets may reduce pain levels compared with pressure garments. Silicone gel sheets may also result in a slight reduction in pain levels compared with no treatment with silicone gel sheets. We are uncertain whether silicone gel sheets decrease pain compared with self-adhesive propylene glycol and hydroxyethyl cellulose sheeting. The evidence is also very uncertain about the effect of silicone gel sheets on pain compared with Gecko Nanoplast.

Certainty of the evidence

Our certainty (confidence) in the evidence was low, or very low. The evidence we found comes from a few studies (sometimes only one), often in small numbers of people, with poorly reported results, so we are not sure how reliable the results are. We therefore think our conclusions would be likely to change if results from further studies become available.

Conclusions

We are uncertain about whether silicone gel sheets work better than most other treatments for hypertrophic scars. Silicone gel sheets may improve the appearance of scars slightly compared with applying onion extract, and may reduce pain compared with no treatment with silicone gel sheets or pressure garments.

Search date

This review includes evidence published up to 21 April 2021.