

Role of Linseed oil in prevention of peri-ileostomy skin excoriation

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Abstract

Introduction: Our gastrointestinal tract bears the entire burden to give us energy for living. Sometimes it gives way and causes lot of sufferings. Many surgeries have been devised to save the lives of patients suffering from these gastrointestinal diseases and stoma formation is one such surgery. Stoma though saves life but it itself causes lot of problems and the most dreaded one is peristomal skin excoriation. Peri-stomal excoriation can be broadly defined as any wound that is adjacent to a stoma, including erosion or ulceration of the peri-stomal skin. It is most dangerous in ileostomy patients. This study was carried out to study the effects of linseed oil in preventing peri-ileostomy skin excoriation. **Materials and Methods:** This study was carried out at Bundelkhand Medical College, Sagar from 2009 to 2012. 24 patients were included in this study in whom ileostomy was done due to perforation peritonitis. Linseed or flax seed oil was applied in all the patients to prevent peri-ileostomy skin excoriation. **Results:** In this study only 3 patients developed minor skin excoriation, rest all were having healthy peri-ileostomy skin with continued use of linseed oil till stoma closure was done. **Conclusion:** Linseed oil gives effective protection and helps in preventing peristomal skin excoriation rather than any other available modality. It is locally available, very economical and its indigenous use has the potential of minimizing the agony and complications associated with peri-ileostomy skin excoriation.

Keywords: Excoriation, Linseed Oil, Peri-ileostomy.

Introduction

Stoma formation is a surgery in which part of intestine is brought out through the abdominal wall and sutured to the skin. Gastrostomy, jejunostomy, ileostomy, colostomy are some types of stoma that are done for various diseases to save life of patients. These can be temporary or permanent depending on the disease, the damage caused by the disease and the status of intestine. The out flow matter from stoma contains fecal matter, loads of bacteria, undigested food, bilious matter, acids by gastric cells, alkalis and all refuse of the body including dead and necrotic cells of the gastrointestinal tract. This continuous spillage of fecal matter and bilious juices around the stoma causes skin excoriation (peristomal excoriation) and leads to severe damage and wound dehiscence. Peri-stomal excoriation can be broadly defined as any wound that is adjacent to a stoma, including erosion or ulceration of the peri-stomal skin. Two-thirds of the patients with ileostomy have peristomal skin excoriation, and need additional support of enterostomal therapists [1]. Many appliances are also used to collect the stomal outflow but these also cause damage to the skin. Aluminium paint [2] is also used for the same, but it also does not prevent the

excoriation though it is helpful.

Linseed or flax seed oil is an herbal product with extensive qualities which since ancient times have been used for the benefit of human beings [3]. It has beneficial effects on human nervous system, digestive system, skin, joints, etc. Apart from its use in protection of skin, linseed oil has also proven its worth in being anti carcinogenic, anti allergic, anti diabetic and anti hyper lipidemic [4]. Owing to the presence of omega -3 fatty acids it has anti inflammatory properties and is also anti thrombotic due to the presence of secoisolaricresinol diglycoside [5]. Its use, as topical application, was assessed in the present study to prevent peri-stomal skin excoriation.

Materials and methods

This study was done at BMC Sagar from 2009 to 2012. 24 consecutive patients with loop-ileostomy were included in this study. The inclusion criteria were: age ≥ 12 years, newly constructed ileostomy, and no pre-existing abdominal skin excoriation or pathology. Patients who succumbed in the peri-operative period and could not complete the follow-up were excluded from the study. Permission was obtained from the institutional ethics committee and informed consent was obtained from the patients.

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During the study period, 14 men and 10 women with mean age 32 years (range 16–58 years), underwent a temporary loop ileostomy for the management of ileal perforation. All the patients were suffering from perforation peritonitis (due to enteric, tubercular or nonspecific perforation) and presented with pain abdomen and features of guarding and rigidity. Diagnosis was confirmed by seeing free gas under diaphragm on straight x-ray abdomen and ultrasound of the abdomen. Routine blood investigations comprising of complete blood picture, blood sugar, urea, creatinine and Serum electrolytes sodium and potassium were investigated. After resuscitation, patients were operated and laparotomy with iliostomy was done in all 24 patients. We used linseed oil over peri-iliostomy skin after surgery before stoma started functioning.

Linseed oil was applied by soaking it in the surgical pad. Over these soaked surgical pads, dry pads were placed and then stoma appliance (Romson's iliostomy bag) was applied. This dressing was changed every 24 hours. This was done in 12 patients. Rest of the 12 patient's simple

dressing with stoma bag application was done. Both the groups were studied under the following heads

1) Degree of excoriation

2) Area of skin excoriation

Degree of excoriation was further divided and studied as

1) Zero degree or no excoriation

2) 1st degree or epidermal loss

3) 2nd degree or epidermal and dermal loss

Area of excoriation was further studied as (distance of excoriation from muco-cutaneous junction)-

1) 0.5 – 1 cm

2) 1.0 – 3 cms

3) 3.1 – 5.0 cms

All the patients were observed on 2nd, 5th, 7th day and 1 month after surgery. Majority of the patients were permitted gradual resumption of normal diet, after stoma function started, which was usually after 4–5 days. Most of the patients had no peri-stomal skin excoriation. Patients were discharged and advised to continue the use of linseed oil and simple dressing respectively.

Results

We had 24 patients in our study, out of which 10 were female patients and 14 were male patients. The youngest patient was 16 years male and the oldest one was 58 year male patient. All the patients had ileal perforations for which iliostomy were done. 10 out of 12 patients who were treated with linseed oil dressing did not develop any kind of excoriation. 2 patients who were being treated with linseed oil dressing developed mild excoriation 1st degree (epidermal loss).

This epidermal loss also recovered later with time. In the group where patients were being treated by simple dressings and with local ointment application, out of 12 patients all developed excoriation. 8 patients had 2nd degree excoriation while 4 had 1st degree excoriation. The area of excoriation in all the patients with 2nd degree was in the range of 3.1 to 5 cms. The area of excoriation in this group with 1st degree excoriation was 1.0 to 3.0 cms.

Table1: Distribution according to the area of excoriation

Area of excoriation	Linseed oil group	Simple dressing group
0.5—1 cms	2(17%)	0
1.0—3.0 cms	0	4(34%)
3.1—5 cms	0	8(76%)

Table 2: Distribution of cases according to the degree of excoriation

Degree of excoriation	Linseed oil group	Simple dressing group
0 degree	10(83%)	0
1 st degree	2(17%)	4(34%)
2 nd degree	0	8(76%)

On comparing the efficacy of linseed oil to protect the excoriation of skin it was found that it is highly efficacious. Only 17% of the patients (n=2) had very mild excoriation that lie in 1st degree of this classification. Patients who were normally treated with local ointments and simple dressings, had nearly 76% of severe excoriation, lies in 2nd degree of this classification.

Discussion

Providing quality care for the person with abdominal stoma requires attention to clinical care, quality of life issues and cost. The condition of peristomal skin in this matrix is significant because compromised tissue usually mean resource utilization - increased patient care needs and the struggle to attain an optimal functional status or comfortable state of well-being, problems with adjustment and increased costs [6].

A comprehensive approach to the prevention and management of peristomal skin complications, begins preoperatively and continues until the stoma can be closed or for rest of the person's life.

The overall rate of peristomal skin complications ranges from 18% to 55% ,the predisposing risk factors being poorly located and/or poorly constructed stoma, obesity, wound complications adjacent to or in the peristomal field, and recurrent disease [6].

The medicinal uses of linseed (flaxseed) were recommended from the time of Hippocrates and have been widely practiced by different cultures in the history [3]. Interestingly, the word liniment, describing a topical application, has its origin from 'line,' a word derived from a Latin or Greek ancestor, linum, meaning flax [3].

Linseed oil or flax seed oil, a colorless to yellowish oil, is obtained from dried ripe seeds of plant with the botanical name of *linum usitatissimum* (Hindi:Alsi) of linaceae family [7]. It is a rich source of alpha linoleic acid (ALA), an omega-3 polyunsaturated fatty acid. Seeds contain about 30-40% of fixed oil, 6% mucilage, 25% proteins, together with wax, resin, sugar, phosphate, and a small quality of glucosides, linamarin [7].

Linseed is cultivated in temperate and tropical regions around the world. It is sky blue flower often open only in the morning. Only the dried seeds and their oil are routinely used for medicinal purposes. The essential fatty acids of linseed oil, ω 3-Alpha Linolenic Acid metabolites have anti-inflammatory properties and help prevent skin inflammation and excoriation, hence largely responsible for skin soothing; healing and revitalizing properties [4].

Linseed oil is amongst the richest plant sources of ω 3- α linolenic Acid, with considerable Vitamin E, ω 6 and ω 9 fatty acids and various phytonutrients [4]. In addition, the oily base of the linseed oil forms a hydrophobic layer which prevents the enzymes in the ileostomy effluence from coming in contact with the skin. Having a high

content of unsaturated esters, linseed oil is particularly susceptible to polymerization (resulting in drying or hardening, which provides additional protection against enzymes in the ileostomy effluence) reactions upon exposure to oxygen in air [8]. Lignans in linseed oil appear to play a role in skin protection from skin cancer and also, breast, colon and prostate cancer [4].

There is paucity of data describing the use of linseed oil for prevention of skin excoriation (after thorough internet and available library search) hence discussing the use of linseed oil with plausible explanation. There is very little or no excoriation with linseed oil uses because it's oily base soothes the peri-ileostomy skin and decreases the cellular damage caused by spillage of ileostomy contents. The oily base of linseed oil forms a protective layer over the peri ileostomy skin which prevents the contact of skin irritants coming from stoma without stopping the cellular respiration [9].

The oily base is basic in nature with $\text{pH} > 7$ which prevents the peri-ileostomy skin layers from maceration. The anti inflammatory properties [7] of linseed oil owing to the presence of ω 3- α linolenic Acid and also reduced production of pro-inflammatory cytokines [10], Tumor Necrosis Factor α , TNF α and Interleukin1 β ,IL-1 β prevent cellular inflammation which leads to oedema and maceration of the tissues. Certain compounds present in linseed oil are anti proliferative [11] in nature and prevent the growth of infective bacteria and microbes on the peristomal skin thus preventing the excoriation of epidermis and dermis.

Apart from the above mentioned points linseed oil is also easily available, highly cost effective and easy to apply compared to the ointments available. Again in patients having less hemoglobin than average ($< 8\text{gm}\%$), in whom we presume poor wound healing; application of linseed oil prevented excoriation of skin. Since the patients in our set up have an average haemoglobin of less than $10\text{gm}\%$ due to malnutrition and in ileostomy patients nutritional status further deteriorates, it is prudent to use an agent like linseed oil whose efficacy to a great extent is not affected by nutritional status and hemoglobin status, as we have observed.

Use of indigenous and traditionally used substances like honey [12] and betel leaf [13] in caring for various wounds is more economical and finds greater acceptance amongst the poorer patients. On performing a cost analysis, the daily expenditure of using linseed oil in present study was found to be INR 6–12 (cost Rs 12 per 100 mL) [9].

Conclusion

Linseed oil is a better modality with effective skin protection to prevent peristomal skin excoriation rather than any other available modality. It significantly decreases the area of excoriation and degree of excoriation and thus decreases the complication at the time of restorative procedure (ileostomy closure). Linseed oil has no deleterious effect on long term application. It is also cost effective, easily available, very economical and cosmetically better and easy to apply. Its indigenous use has the potential of minimizing the agony and complications associated with peri-ileostomy skin excoriation.

Thus the use of linseed oil is recommended to prevent the excoriation of peri stomal skin. However it is a short term study and long term study, large sample size and long follow up is required to fully establish the superiority of linseed oil over other available modalities to prevent skin excoriation in cases of stoma.

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