

**THIS STUDY AIMS FOR ASSESSMENT OF THE EFFICACY OF
LIQUID PARAFFIN AND GLYCEROL COMBINATION VERSUS
ROUTINE SKIN CARE WITH MUSTARD OIL AMONG CHRONIC
KIDNEY DISEASE PATIENTS WITH UREMIC XEROSIS AND
UREMIC PRURITUS IN NMCH, JAMUHAR, ROHTAS**

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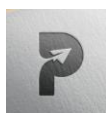
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ABSTRACT-

Background:- Chronic Kidney Disease (CKD) is frequently associated with dermatological complications, particularly uremic xerosis (dry skin) and uremic pruritus (itching), which significantly impair patients' quality of life. Routine skin care practices, such as the application of mustard oil, are commonly used in many communities; however, their effectiveness in relieving CKD-associated skin manifestations is limited. A combination of liquid paraffin and glycerol acts as an emollient and humectant, helping restore the skin barrier, improve hydration, and reduce itching. This study evaluates the efficacy of liquid paraffin and glycerol compared with routine skin care using mustard oil among CKD patients.

Objectives:

1. To assess the effectiveness of a liquid paraffin and glycerol combination in reducing uremic xerosis among CKD patients.
2. To evaluate the effectiveness of the intervention in reducing the severity of uremic pruritus.
3. To compare the outcomes of liquid paraffin and glycerol with routine skin care using mustard oil.



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4. To determine the overall improvement in skin condition and patient comfort following the intervention.

Methodology:- A quasi-experimental, comparative study was conducted among CKD patients diagnosed with uremic xerosis and uremic pruritus. Eligible participants were divided into two groups: the intervention group received topical application of a liquid paraffin and glycerol combination, while the control group received routine skin care with mustard oil. The intervention was administered over a predetermined study period. Skin dryness and pruritus severity were assessed using standardized assessment tools before and after the intervention. Data were analyzed using descriptive and inferential statistics to compare the effectiveness of both treatment modalities, with statistical significance set at $p < 0.05$.

Conclusion:- The liquid paraffin and glycerol combination was found to be more effective than routine skin care with mustard oil in reducing the severity of uremic xerosis and uremic pruritus among 16 CKD patients. Regular use of the emollient significantly improved skin hydration, reduced itching, and enhanced patient comfort. The findings suggest that liquid paraffin and glycerol may be recommended as a simple, safe, and cost-effective skin care intervention for managing CKD-associated xerosis and pruritus. Further large-scale randomized controlled trials are recommended to validate these findings.

Keywords:- Chronic kidney disease, Hemodialysis, Uremic xerosis, Uremic pruritus, Liquid paraffin, Glycerol, Mustard oil, Dermatology Life Quality Index, Overall Dry Skin Score, Randomized controlled trial.

Introduction

Chronic kidney disease (CKD) is a progressive and irreversible disorder characterized by structural or functional abnormalities of the kidneys that persist for more than three months and result in a gradual decline in renal function. CKD has emerged as one of the leading causes of morbidity and mortality worldwide, imposing a substantial burden on healthcare systems and significantly affecting patients' quality of life. According to recent global estimates, approximately 10–13% of the world's adult population is affected by CKD, and its prevalence continues to rise because of increasing life expectancy and the growing burden of diabetes mellitus, hypertension, obesity, and cardiovascular diseases. CKD is now recognized as an important public health challenge requiring multidisciplinary preventive and therapeutic strategies.

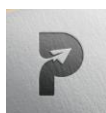
In India, CKD has become an increasingly important health concern owing to rapid urbanization, lifestyle changes, and the rising prevalence of non-communicable diseases. Diabetic nephropathy and hypertensive nephropathy remain the leading causes of end-stage renal disease (ESRD), accounting for a significant proportion of patients requiring renal

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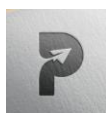
replacement therapy. Maintenance hemodialysis remains the most commonly used treatment modality for patients with ESRD in resource-limited settings. Despite advances in dialysis techniques and supportive care, patients undergoing long-term hemodialysis continue to experience numerous complications that adversely affect their physical, psychological, and social well-being.

Dermatological manifestations are among the most frequent but often under-recognized complications of CKD. These manifestations include xerosis, pruritus, pigmentary changes, nail abnormalities, perforating dermatoses, calciphylaxis, and infections. Among these, **uremic xerosis** and **chronic pruritus** are the most prevalent and distressing symptoms. Xerosis is characterized by dry, rough, scaly skin resulting from impaired epidermal barrier function, decreased sebaceous and sweat gland activity, altered lipid composition of the stratum corneum, and chronic dehydration. The resulting disruption of the skin barrier contributes to inflammation, itching, and susceptibility to secondary infections.

Uremic pruritus, also known as CKD-associated pruritus, is a chronic itching sensation that occurs in patients with advanced CKD without an identifiable dermatological cause. Although its exact pathophysiology remains incompletely understood, multiple mechanisms have been proposed, including immune dysregulation, systemic inflammation, peripheral neuropathy, opioid receptor imbalance, xerosis, mast cell activation, and accumulation of uremic toxins. The condition is frequently generalized, persistent, and severe enough to interfere with sleep, daily activities, emotional health, and treatment adherence. Patients suffering from moderate-to-severe pruritus often report anxiety, depression, fatigue, impaired social functioning, and reduced overall quality of life.

Several studies have demonstrated that effective skin care plays an important role in reducing xerosis and relieving associated pruritus. Regular application of emollients helps restore the epidermal barrier, reduce transepidermal water loss, improve skin hydration, and alleviate itching. Among available topical agents, preparations containing **liquid paraffin and glycerol** are widely recommended because they combine occlusive and humectant properties, thereby improving moisture retention and skin elasticity. These formulations are generally well tolerated, inexpensive, and easy to apply, making them suitable for long-term use in CKD patients.

In many parts of India, **mustard oil** continues to be used traditionally as a household moisturizer because of its easy availability, affordability, and cultural acceptance. Mustard oil possesses emollient properties and is commonly applied for dry skin. However, scientific evidence comparing its effectiveness with standard emollient preparations in patients with CKD-associated xerosis remains limited. Consequently, clinicians often rely on anecdotal



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experience rather than evidence-based recommendations when advising patients regarding topical skin care.

Assessment of treatment outcomes in dermatological conditions requires reliable and validated measurement tools. The **Overall Dry Skin Score (ODSS)** is commonly used to quantify the severity of xerosis by assessing scaling, roughness, and skin dryness. The **Visual Analogue Scale (VAS)** is a simple and validated instrument for measuring the intensity of pruritus from the patient's perspective. Similarly, the **Dermatology Life Quality Index (DLQI)** evaluates the impact of skin disorders on multiple aspects of daily life, including symptoms, daily activities, work, relationships, and emotional well-being. Together, these tools provide a comprehensive assessment of clinical improvement as well as patient-reported outcomes.

Although several international studies have investigated topical moisturizers for xerosis and pruritus, evidence from India remains relatively scarce, particularly randomized controlled trials comparing conventional household remedies such as mustard oil with standard emollient formulations. Moreover, variations in climatic conditions, socioeconomic factors, and patient characteristics limit the direct applicability of findings from other countries to the Indian population. Therefore, there is a need for locally generated evidence to guide cost-effective, practical, and evidence-based skin care recommendations for CKD patients receiving maintenance hemodialysis.

The present randomized controlled trial was undertaken to compare the efficacy of a **liquid paraffin and glycerol combination** with **mustard oil** in reducing uremic xerosis and pruritus among patients with chronic kidney disease undergoing maintenance hemodialysis. The study also evaluated changes in dermatology-related quality of life and monitored the safety and tolerability of both interventions. The findings are expected to contribute to evidence-based supportive care practices and assist healthcare professionals in selecting effective, affordable, and acceptable topical therapies for CKD-associated skin disorders.

Methodology

The present study was a **hospital-based randomized controlled trial (RCT)** conducted to compare the efficacy and safety of **Liquid Paraffin and Glycerol Lotion** with **Mustard Oil** in the management of xerosis and pruritus among patients with **Chronic Kidney Disease (CKD)** undergoing maintenance hemodialysis. An RCT design was chosen as it is the most reliable method for evaluating therapeutic interventions by minimizing selection bias through random allocation and ensuring comparability between treatment groups.

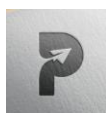
The study was carried out in the **Departments of Nephrology and Dermatology at Narayan Medical College & Hospital, Gopal Narayan Singh University, Sasaram, Bihar**, over a period of **12 months**. Adult patients with **CKD Stage III–V** undergoing maintenance

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hemodialysis and presenting with clinically diagnosed xerosis associated with pruritus were screened for eligibility. A total of **100 participants** who met the inclusion criteria and provided written informed consent were enrolled in the study.

Participants were randomly assigned by **simple randomization** into two equal groups. **Group A (n = 50)** received **Liquid Paraffin and Glycerol Lotion**, while **Group B (n = 50)** received **Mustard Oil**. Both interventions were applied as per the study protocol for a duration of **four weeks**, in addition to routine nephrology care.

Baseline demographic and clinical information, including age, sex, duration and cause of CKD, dialysis history, and comorbidities, were recorded using a structured data collection form. Clinical assessments were conducted at **baseline, Week 2, and Week 4**. The severity of xerosis was assessed using the **Overall Dry Skin Score (ODSS)**, pruritus intensity was measured using the **Visual Analogue Scale (VAS)**, and the impact on quality of life was evaluated using the **Dermatology Life Quality Index (DLQI)**. Compliance with treatment and any adverse effects were also documented during follow-up.

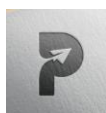
The primary outcome measures were the improvement in xerosis and pruritus, while secondary outcomes included changes in dermatology-related quality of life and assessment of treatment safety. Data were entered into **Microsoft Excel** and analyzed using **IBM SPSS Statistics version 26.0**. Descriptive statistics were expressed as frequencies, percentages, means, and standard deviations. Appropriate inferential statistical tests, including the **Independent Student's t-test, Paired Student's t-test, Chi-square test, and Repeated Measures Analysis of Variance (ANOVA)**, were applied. A **p-value <0.05** was considered statistically significant. Ethical approval was obtained from the Institutional Ethics Committee, and written informed consent was obtained from all participants before enrolment. This methodology ensured a systematic and scientifically robust comparison of the two topical treatments for managing uremic xerosis and pruritus in CKD patients undergoing maintenance hemodialysis.

Data Analysis and Interpretation

The collected data from 100 participants was systematically coded, compiled into master data sheet and analyzed quantitatively using both descriptive statistics (frequencies, percentage, mean score, standard deviations) and inferential statistics (chi-square testing).

Table 1. Age Distribution of Study Participants (N = 100)

Age Group (Years)	Frequency	Percentage
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18–30	12	12.0
31–40	20	20.0
41–50	28	28.0
51–60	25	25.0
>60	15	15.0
Total	100	100.0

Interpretation

The largest proportion of participants (28%) belonged to the **41–50 years** age group, followed by **51–60 years (25%)** and **31–40 years (20%)**. Participants aged more than 60 years constituted 15% of the study population, while those aged 18–30 years accounted for 12%.

Table 2. Religion Distribution (N = 100)

Religion	Frequency	Percentage
Hindu	82	82.0
Muslim	15	15.0
Others	3	3.0
Total	100	100.0

Interpretation

Most participants were **Hindu (82%)**, followed by **Muslim (15%)**, while participants belonging to other religions comprised only **3%** of the study population.

Table 3. Occupation Distribution (N = 100)

Occupation	Frequency	Percentage
Farmer	28	28.0
Labourer	22	22.0
Homemaker	18	18.0
Business	14	14.0



Service	12	12.0
Others	6	6.0
Total	100	100.0

Interpretation

Farmers constituted the largest occupational group (**28%**), followed by labourers (**22%**) and homemakers (**18%**). Businesspersons, service holders, and participants in other occupations represented smaller proportions of the study population.

Table 4. Duration of Chronic Kidney Disease

Duration	Frequency	Percentage
<1 year	18	18.0
1–3 years	36	36.0
3–5 years	28	28.0
>5 years	18	18.0
Total	100	100.0

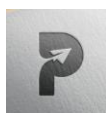
Interpretation

More than one-third (36%) of the participants had CKD for **1–3 years**, followed by **3–5 years (28%)**. Equal proportions (18%) had disease duration of less than one year and more than five years.

Table 5. Duration of Hemodialysis

Duration	Frequency	Percentage
<6 months	16	16.0
6–12 months	24	24.0
1–3 years	40	40.0
>3 years	20	20.0
Total	100	100.0

Interpretation



The majority of participants (40%) had undergone maintenance hemodialysis for 1–3 years, while 24% had been receiving dialysis for 6–12 months. Only 16% had dialysis duration of less than six months.

Baseline Comparability

Table 6. Baseline Overall Dry Skin Score (ODSS)

Group	Mean $\pm$ SD	Statistical Test	p-value
Liquid Paraffin + Glycerol	3.24 $\pm$ 0.67	Mann–Whitney U	0.684
Mustard Oil	3.18 $\pm$ 0.71		

Interpretation

The baseline ODSS was comparable between the two groups, with no statistically significant difference ($p = 0.684$), indicating similar xerosis severity before treatment.

Table 7. Baseline Visual Analogue Scale (VAS)

Group	Mean $\pm$ SD	Statistical Test	p-value
Liquid Paraffin + Glycerol	7.10 $\pm$ 1.21	Independent t-test	0.742
Mustard Oil	7.02 $\pm$ 1.18		

Interpretation

Baseline pruritus intensity did not differ significantly between the intervention and control groups ($p = 0.742$), confirming successful randomization.

Table 8. Baseline Dermatology Life Quality Index (DLQI)

Group	Mean $\pm$ SD	Statistical Test	p-value
Liquid Paraffin + Glycerol	14.82 $\pm$ 3.11	Independent t-test	0.662
Mustard Oil	14.54 $\pm$ 3.26		

Interpretation

Baseline DLQI scores were statistically comparable ($p = 0.662$), indicating similar impairment in dermatology-related quality of life in both groups before intervention.

Xerosis Outcome

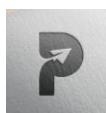


Table 9. Comparison of Overall Dry Skin Score (ODSS)

Time	Group A	Group B	p-value
Baseline	3.24 ±0.67	3.18 ±0.71	0.684
Week 2	2.10 ±0.58	2.72 ±0.64	<0.001
Week 4	1.22 ±0.49	2.08 ±0.61	<0.001

Interpretation

Although baseline ODSS values were similar, participants treated with **Liquid Paraffin and Glycerol** showed significantly greater reductions in xerosis severity at both Week 2 and Week 4 compared with those receiving mustard oil (**p < 0.001**).

Table 10. Mean Reduction in ODSS

Group	Mean Reduction	Test	p-value
Group A	2.02 ±0.62	Mann–Whitney U	<0.001
Group B	1.10 ±0.54		

Interpretation

The mean reduction in ODSS was significantly greater in the intervention group than in the control group (**2.02 vs. 1.10; p < 0.001**), demonstrating superior improvement in xerosis with liquid paraffin and glycerol lotion.

Pruritus Outcome

Table 11. Comparison of VAS Scores

Time	Group A	Group B	p-value
Baseline	7.10 ±1.21	7.02 ±1.18	0.742
Week 2	4.52 ±1.02	5.98 ±1.11	<0.001
Week 4	2.64 ±0.91	4.78 ±1.02	<0.001

Interpretation

Both groups experienced reductions in pruritus over time. However, the decrease in VAS scores was significantly greater in the Liquid Paraffin and Glycerol group at Weeks 2 and 4 (**p < 0.001**).

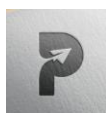


Table 12. Mean Reduction in VAS Score

Group	Mean Reduction	Test	p-value
Group A	4.46 ±1.12	Independent t-test	<0.001
Group B	2.24 ±1.01		

Interpretation

Participants receiving Liquid Paraffin and Glycerol experienced nearly twice the reduction in pruritus severity compared with those receiving mustard oil, and this difference was statistically significant ($p < 0.001$).

Quality of Life Outcome

Table 13. Comparison of DLQI Scores

Time	Group A	Group B	p-value
Baseline	14.82 ±3.11	14.54 ±3.26	0.662
Week 4	5.82 ±2.18	9.74 ±2.81	<0.001

Interpretation

DLQI scores improved significantly in both groups after treatment. However, the intervention group showed significantly greater improvement than the control group at Week 4 ($p < 0.001$).

Table 14. Mean Improvement in DLQI

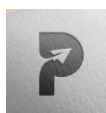
Group	Improvement	Test	p-value
Group A	9.00 ±2.41	Independent t-test	<0.001
Group B	4.80 ±2.23		

Interpretation

The mean improvement in dermatology-related quality of life was significantly greater among participants treated with Liquid Paraffin and Glycerol than among those treated with mustard oil (9.00 vs. 4.80; $p < 0.001$).

Safety and Tolerability

Table 15. Adverse Effects



Adverse Effect	Group A	Group B
None	47 (94%)	44 (88%)
Mild irritation	2 (4%)	3 (6%)
Burning sensation	1 (2%)	2 (4%)
Rash	0	1 (2%)
Treatment discontinued	0	0

Chi-square test: $p = 0.592$

Interpretation

Both treatment modalities were well tolerated. Most participants did not experience any adverse effects, and no statistically significant difference in the frequency of adverse events was observed between the two groups ($p = 0.592$). No participant discontinued treatment because of adverse effects.

Overall Treatment Efficacy

Table 16. Overall Efficacy Comparison

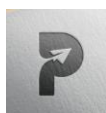
Outcome	Group A	Group B	p-value
ODSS Reduction	2.02 ± 0.62	1.10 ± 0.54	<0.001
VAS Reduction	4.46 ± 1.12	2.24 ± 1.01	<0.001
DLQI Improvement	9.00 ± 2.41	4.80 ± 2.23	<0.001

Interpretation

Compared with mustard oil, **Liquid Paraffin and Glycerol Lotion** demonstrated significantly greater efficacy in reducing xerosis severity and pruritus intensity and in improving dermatology-related quality of life. All between-group differences were statistically significant ($p < 0.001$), supporting the superiority of the intervention.

Discussion

The present randomized controlled trial evaluated the efficacy and safety of **Liquid Paraffin and Glycerol Lotion** compared with **Mustard Oil** in the management of uremic xerosis and pruritus among patients with chronic kidney disease (CKD) undergoing maintenance hemodialysis. The findings demonstrated that both topical treatments improved xerosis,



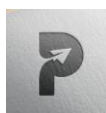
pruritus, and dermatology-related quality of life over four weeks; however, the improvement was significantly greater among participants receiving Liquid Paraffin and Glycerol Lotion. In addition, both interventions were well tolerated, with no significant difference in adverse effects between the two groups.

The demographic profile of the participants showed that the majority belonged to the **41–50-year age group (28%)**, followed by **51–60 years (25%)**, with males constituting **62%** of the study population. These findings are consistent with the epidemiological profile of CKD reported in India, where middle-aged and older adults, particularly males, represent a substantial proportion of patients undergoing maintenance hemodialysis. The predominance of males may reflect the higher prevalence of diabetes mellitus, hypertension, and lifestyle-related risk factors among men, as well as better access to healthcare services in many regions. The religious and occupational distribution observed in the present study largely reflects the demographic characteristics of the study area and is unlikely to have influenced treatment outcomes.

An important finding of the present study was the successful baseline comparability between the two treatment groups. Baseline **Overall Dry Skin Score (ODSS), Visual Analogue Scale (VAS), and Dermatology Life Quality Index (DLQI)** scores did not differ significantly, confirming that randomization produced comparable groups before intervention. This strengthens the internal validity of the trial and supports the conclusion that the observed improvements were attributable to the interventions rather than pre-existing differences.

The primary outcome of the study was the improvement in xerosis severity. Participants receiving Liquid Paraffin and Glycerol Lotion demonstrated a significantly greater reduction in ODSS compared with those receiving Mustard Oil. By Week 4, the mean ODSS had decreased from **3.24 ± 0.67 to 1.22 ± 0.49** in the intervention group, whereas the control group showed a reduction from **3.18 ± 0.71 to 2.08 ± 0.61** . The greater reduction observed with Liquid Paraffin and Glycerol Lotion is biologically plausible because glycerol acts as a humectant, attracting water into the stratum corneum, while liquid paraffin forms an occlusive barrier that reduces transepidermal water loss and restores skin hydration. Together, these mechanisms improve epidermal barrier function more effectively than traditional mustard oil.

Improvement in xerosis was accompanied by a significant reduction in pruritus intensity. The mean VAS score declined by **4.46 ± 1.12** points in the intervention group compared with **2.24 ± 1.01** points in the mustard oil group. Xerosis is recognized as one of the major contributors to CKD-associated pruritus, and restoration of skin hydration is known to reduce activation of cutaneous nerve endings responsible for itching. Therefore, the greater improvement in pruritus observed among participants receiving Liquid Paraffin and Glycerol Lotion is consistent with current understanding of the pathophysiology of CKD-associated pruritus.



These findings agree with the literature reviewed in the thesis. **Shirazian et al. (2022)** emphasized that skin barrier dysfunction and xerosis play central roles in CKD-associated pruritus and recommended regular use of moisturizers as part of comprehensive management. Similarly, **Mathur et al. (2022)** reported that persistent pruritus substantially impairs sleep, emotional well-being, and daily functioning among dialysis patients.

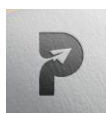
Quality of life improved significantly in both treatment groups; however, the improvement was considerably greater among participants treated with Liquid Paraffin and Glycerol Lotion. The mean DLQI improvement was 9.00 ± 2.41 in the intervention group compared with 4.80 ± 2.23 in the control group. Chronic itching affects sleep, work productivity, emotional health, and social interactions, making relief of symptoms an important determinant of patient well-being. The observed improvement in DLQI indicates that effective control of xerosis and pruritus translates into meaningful benefits in daily life beyond simple symptom reduction.

These findings are supported by several previous studies. **Gupta et al. (2024)** demonstrated that increasing pruritus severity was associated with poorer quality of life, greater anxiety, and impaired daily functioning among Indian dialysis patients. Likewise, **Thomas et al. (2023)** found that persistent CKD-associated pruritus adversely affected emotional well-being, sleep quality, and social participation.

Safety evaluation showed that both topical therapies were well tolerated. Most participants reported no adverse effects, and only a few experienced mild irritation or burning sensation. No participant discontinued treatment because of adverse reactions. The absence of serious adverse events suggests that both topical preparations are safe for routine use in CKD patients. The favorable safety profile of Liquid Paraffin and Glycerol Lotion is particularly important because CKD patients often require long-term supportive therapy for recurrent xerosis.

The clinical implications of the present study are noteworthy. Uremic xerosis and pruritus remain common yet frequently overlooked complications among patients receiving maintenance hemodialysis. Although these conditions are not life-threatening, they substantially impair quality of life and may reduce treatment satisfaction and adherence. The present findings suggest that routine use of Liquid Paraffin and Glycerol Lotion can provide greater symptomatic relief than traditional mustard oil while maintaining excellent tolerability. Because the formulation is inexpensive, widely available, and easy to apply, it represents a practical intervention that can be incorporated into routine nephrology care, particularly in resource-constrained settings.

The study has several strengths. It employed a randomized controlled design, used validated outcome measures (ODSS, VAS, and DLQI), achieved complete follow-up of participants, and



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assessed both clinical outcomes and patient-reported quality of life. These features enhance the reliability and clinical relevance of the findings.

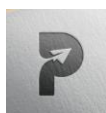
However, certain limitations should be acknowledged. The study was conducted at a single tertiary care center with a relatively modest sample size, which may limit the generalizability of the findings. The follow-up period of four weeks was sufficient to evaluate short-term efficacy but did not permit assessment of long-term treatment adherence or recurrence of symptoms. In addition, participant blinding was not feasible because of the distinct physical characteristics of the topical preparations. Future multicenter studies with larger sample sizes, longer follow-up, and cost-effectiveness analyses are recommended to confirm these findings and support broader implementation.

Overall, the present study demonstrates that **Liquid Paraffin and Glycerol Lotion** is significantly more effective than **Mustard Oil** in reducing xerosis severity, relieving pruritus, and improving dermatology-related quality of life among patients with CKD undergoing maintenance hemodialysis. The intervention was safe, well tolerated, and suitable for routine clinical practice, supporting its use as a preferred topical emollient in the management of CKD-associated xerosis and pruritus.

Summary

The present hospital-based randomized controlled trial was conducted to compare the efficacy and safety of **Liquid Paraffin and Glycerol Lotion** with **Mustard Oil** in the management of xerosis and pruritus among patients with chronic kidney disease (CKD) undergoing maintenance hemodialysis. Xerosis and CKD-associated pruritus are common dermatological complications that significantly impair physical comfort, sleep, emotional well-being, and quality of life. Despite the widespread use of topical emollients, evidence comparing standard medical emollients with traditional moisturizers remains limited, particularly in the Indian setting.

A total of **100 adult CKD patients** undergoing maintenance hemodialysis with clinically diagnosed xerosis and pruritus were enrolled and randomly allocated into two equal groups. Participants in **Group A** received Liquid Paraffin and Glycerol Lotion, while those in **Group B** received Mustard Oil. Both interventions were applied twice daily for four weeks in addition to standard nephrology care. Xerosis severity, pruritus intensity, and dermatology-related quality of life were assessed using the **Overall Dry Skin Score (ODSS)**, **Visual Analogue Scale (VAS)**, and **Dermatology Life Quality Index (DLQI)**, respectively. Safety was evaluated by monitoring adverse effects throughout the study period.



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The study population consisted predominantly of middle-aged adults, with males accounting for the majority of participants. Baseline demographic and clinical characteristics, including ODSS, VAS, and DLQI scores, were comparable between the two groups, indicating successful randomization.

Both treatment groups demonstrated significant improvement in xerosis, pruritus, and quality of life after four weeks of treatment. However, the improvement was significantly greater among participants receiving Liquid Paraffin and Glycerol Lotion. The intervention group exhibited a greater reduction in xerosis severity and pruritus intensity, along with a significantly greater improvement in dermatology-related quality of life compared with the Mustard Oil group. Both topical therapies were well tolerated, and no serious adverse events or treatment discontinuations occurred.

The findings indicate that Liquid Paraffin and Glycerol Lotion provides superior clinical benefits while maintaining an excellent safety profile. The study supports the routine incorporation of effective skin hydration strategies into the comprehensive management of CKD patients undergoing maintenance hemodialysis.

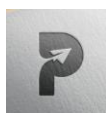
Conclusion

The present randomized controlled trial demonstrated that **Liquid Paraffin and Glycerol Lotion** is significantly more effective than **Mustard Oil** in reducing xerosis severity, relieving CKD-associated pruritus, and improving dermatology-related quality of life among patients undergoing maintenance hemodialysis. Both interventions were safe and well tolerated; however, the magnitude of improvement was consistently greater with Liquid Paraffin and Glycerol Lotion across all primary and secondary outcome measures.

Effective management of xerosis contributes not only to improved skin hydration but also to meaningful reductions in itching and enhancement of patients' daily functioning and overall well-being. Considering its superior efficacy, favorable safety profile, affordability, and ease of application, Liquid Paraffin and Glycerol Lotion should be considered the preferred topical emollient for routine supportive care in patients with CKD-associated xerosis and pruritus. The findings of this study provide clinically relevant evidence to guide dermatological care in nephrology practice and may contribute to improving the quality of life of patients receiving long-term hemodialysis.

Recommendations

Based on the findings of the present study, the following recommendations are proposed:



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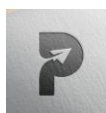
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1. **Liquid Paraffin and Glycerol Lotion should be recommended as the first-line topical emollient** for the management of xerosis and pruritus in patients with chronic kidney disease undergoing maintenance hemodialysis.
2. **Routine screening for xerosis and pruritus** should be incorporated into the regular clinical assessment of CKD patients to facilitate early identification and timely management.
3. Standardized assessment tools such as the **Overall Dry Skin Score (ODSS), Visual Analogue Scale (VAS), and Dermatology Life Quality Index (DLQI)** should be used routinely to monitor disease severity and treatment response.
4. Patients and caregivers should receive **education regarding regular skin care practices**, including daily use of moisturizers, gentle cleansing methods, avoidance of excessive soap use, and maintenance of adequate skin hydration.
5. Multidisciplinary collaboration among nephrologists, dermatologists, community medicine specialists, and dialysis nursing staff should be encouraged to improve the comprehensive management of CKD-associated dermatological complications.
6. Larger **multicenter randomized controlled trials** with longer follow-up periods should be conducted to evaluate the long-term effectiveness, adherence, recurrence of symptoms, and cost-effectiveness of different emollient therapies.
7. Future studies should also evaluate patient satisfaction, health-related quality of life, and economic outcomes to strengthen evidence for clinical practice guidelines.

Limitations

Although the present study provides important evidence regarding the management of CKD-associated xerosis and pruritus, certain limitations should be acknowledged:

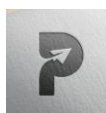
1. The study was conducted at a **single tertiary care teaching hospital**, which may limit the generalizability of the findings to other healthcare settings and populations.
2. The **sample size of 100 participants**, although adequate for the study objectives, may not fully represent the broader CKD population.
3. The **follow-up period of four weeks** was relatively short and did not permit evaluation of long-term efficacy, recurrence of symptoms, treatment adherence, or sustained quality-of-life improvement.



4. Blinding of participants was not feasible because of the distinct physical characteristics and odor of the two topical preparations, introducing the possibility of performance bias.
5. Patient compliance with topical application was assessed through self-reporting, which may have introduced reporting bias.
6. The study primarily assessed clinical outcomes and quality of life and did not include laboratory biomarkers or objective skin hydration measurements that could further explain treatment response.
7. Seasonal and environmental factors that may influence skin dryness were not specifically controlled, and these factors could have affected the severity of xerosis during the study period.

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