ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 1| January 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

EFFECTIVENESS OF TOPICAL APPLICATION OF AVENA SATIVA ON UREMIC XEROSIS, HYPERPIGMENTATION AND PRURITUS AMONG PATIENTS WITH CHRONIC KIDNEY DISEASE

Mrs.Leeba L J[1] , Mrs. Smitha P V[2] , Mrs. Usharani E N[3]

[1]Lecturer,College of Nursing Nirmala Medical centre, Muvattupuzha
[2]Assistant Professor, Govt. College of Nursing, Kottayam
[3]Assistant Professor, Govt. College of Nursing, Kottayam

ABSTRACT

Dermatologic manifestations of renal disease are common findings in patients with end-stage renal disease. This quantitative experimental study investigated the effectiveness of topical application of Avena Sativa on uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease.

Background: *The effects of chronic kidney disease are complex and may lead to dysfunction of multiple organs, including the skin, most patients presenting with at least one dermatologic alteration. Uremic xerosis, hyperpigmentation and pruritus were having a considerable negative impact on a patient's quality of life.*

Aims: *The objectives of the study were evaluating the effectiveness of topical application of Avena Sativa on uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease.*

Methods: *A quasi experimental pre-test-post test control group design was used for the study. The data collected from 60 Chronic kidney disease patients , 30 each in control and experimental group, were selected using non probability purposive sampling technique.On the first day of observation, pre-test was performed. After 24 hours of allergic test, non allergic subjects were selected for the intervention. Post-test was performed on the eighth day of intervention.*

Results: *Avena Sativa had significant effect in reducing uremic xerosis ($U=164$, $p<0.001$) hyperpigmentation ($U=246$, $p<0.01$) and pruritus ($U=202$, $p<0.01$).There was significant association between uremic xerosis and duration of CKD ($p<0.01$) and positive correlation between uremic xerosis and pruritus (ρ is 0.56 at 0.01 level)*

Limitations and implications : *Randomization was not done and had limited time for the study. A long term study can be conducted to determine the long term effect of topical application of Avena Sativa among patients with chronic kidney disease.*

Conclusion:*Topical application of Avena Sativa was effective in reducing uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease.*

Keywords: *Avena Sativa; Uremic xerosis; Hyperpigmentation;Pruritus; Patients withchronic kidney disease*

INTRODUCTION

CKD is a worldwide public health problem, affecting over 750 million persons worldwide (Couser WG). As kidney failure advances and the organ's function is severely impaired, dangerous levels of waste and fluid can rapidly build up in the body. Skin involvement in this population can be extensive and dramatically worsen quality of life. The skin is an external reflection of much renal pathology and hence serves as an indispensable tool for the clinician.

Dermatologic examination of patients with end-stage renal disease (ESRD) has shown that 50-100% of patients have at least one dermatologic condition. A high prevalence of cutaneous disorders is expected, because most patients with ESRD have an underlying disease process with skin. (Szepietowski JC B. E.)It is necessary that health professionals who deal with these patients on a daily basis have knowledge about these cutaneous events along with underlying disease.

Research studies shows that Avena Sativa (oats) have inherent anti-inflammatory and antihistaminic abilities. The Avenanthramides are phenolic compounds present in oats and exhibit antioxidant activity in various cell types and it can actually inhibit the release of pro-inflammatory cytokines and histamine, so colloidal oatmeal can be helpful in cases of hives. These oatmeal phenols are also impressively known for being strong ultraviolet absorbers. In addition, the use of topical formulations of colloidal oatmeal can reduce the need for and use of questionable corticosteroids (Nakhaee S).

The investigator found that CKD patients are suffering from uremic xerosis, hyperpigmentation and pruritus. The health care professionals are giving importance to the other systemic changes of the illness and ignoring the cutaneous aspects of the patients.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 1| January 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

The researcher undertook the present study because there is pressing need to address these skin problems among CKD patients

HYPOTHESES

H1: There is a significant difference in uremic xerosis among patients with CKD between control and experimental group.
H2: There is a significant difference in hyperpigmentation among patients with CKD between control and experimental group.
H3: There is a significant difference in pruritus among patients with CKD between control and experimental group.
H4: There is a significant correlation between uremic xerosis and pruritus among patients with chronic kidney disease.
H5: There is a significant association between uremic xerosis among patients with chronic kidney disease and selected variables.

REVIEW OF LITERATURE

Both pub med and Google scholar were searched for articles pertaining to Effectiveness of topical application of Avena Sativa on uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease. Results were limited to English jounal published from 2002-2019. The results of effectiveness of oats in treatment of itch associated with dry, irritated skin demonstrate that colloidal oat extracts exhibit direct anti-oxidant and anti- inflammatory activities, which may provide the mechanisms for observed dermatological benefits while using the colloidal oatmeal skin protectant lotion. Results found that extracts of colloidal oatmeal diminished pro-inflammatory cytokines in vitro and the colloidal oat skin protectant lotion showed significant clinical improvements in skin dryness, scaling, roughness, and itch intensity. (Michelle Garay M J. N.)

A clinical trial on Aveeno skin relief moisturizing lotion in patients with itching accompanied by skin lesions and xerosis showed that after treatment, a significant improvement of cutaneous lesions including erythema, scaling, scratching lesions, lichenization, and pruritus in 52 of 54 treated patients (96%). The lotion was well tolerated by all patients and it is an effective moisturizing emollient that reduces pruritus in subjects with xerosis. (Pacifico A)

Crossover randomized clinical trial on comparison of Avena Sativa, Vinegar, and Hydroxyzine for uremic pruritus of hemodialysis patients results showed that Avena sativa lotion significantly decreased the mean scores of pruritus intensity, consequences, and the verbal descriptor although it did not have a significant effect on the frequency of pruritus and the pruritic surface. Vinegar and hydroxyzine significantly decreased all of the scores. (Nakhaee S)

ETHICS

The research study was started after getting Institutional ethical committee clearance (ICE NO: 145/2019) and formal permissions from Principal Government College of Nursing, Kottayam, Scientific review committee the Head of the Department of Nephrology and Medicine of Government Medical college hospital, Kottayam. The duration of the study was six weeks from 28-01-2020 to 07-03-2020. Screening of 100 subjects was done to select the samples who meet inclusion criteria. Sixty samples was selected using non-probability purposive sampling technique. Among the selected subjects, 30 subjects were then selected for experimental group and then as control group. Purpose of the study was explained to the participants and informed consent was obtained. The confidentiality of the collected data was assured.

SAMPLE SELECTION

Population

The study population comprises all patients with chronic kidney disease stage V admitted in Medical College Hospital, Kottayam

Sample

The study sample include the patients with chronic kidney disease admitted in ward 2,3,6,9 and 26 of Medical College Hospital Kottayam, who fulfil the inclusion criteria, with 30 subjects in the control group and 30 in the experimental group.

Sampling Technique

Non probability purposive sampling technique
Sample size and calculation
Sample size is calculated using the following formula

$$\text{Sample size } n = \frac{(s_1^2 + s_2^2)(z_{1-\alpha/2} + z_{1-\beta})^2}{(\bar{X}_1 - \bar{X}_2)^2}$$

Here, $Z_{1-\alpha/2}$ =1.96 when α=0.05
And when power 1-β=0.8, we have $Z_{1-\beta}$=0.842
$(\bar{X}_1 - \bar{X}_2)^2$are sample means and S_1 and S_2 are the sample standard deviations which are to be obtained from similar studies or pilot study[22]

$$n = \frac{(1.69^2 + 2.34^2)(1.96 + 0.842)^2}{(5.21 - 3.62)^2}$$

=26.1

The total sample size is estimated as 26.1 by anticipating10% attrition, approximately each group sample size is fixed as 30 in control group and 30 in experimental group

Eligibility Criteria

Patients with chronic kidney disease stage V who are

- able to comprehend and communicate Malayalam or English
- having uremic xerosis, hyper pigmentation and pruritus

Study Setting

The study was conducted in patients with CKD under nephrology and medical department of Govt. Medical College hospital Kottayam. At present the bed strength is 1802 with 28 clinical departments including all specialties and super specialties with all diagnostic and therapeutic facilities. The study was carried out in the nephrology ward 26 and medical wards 2,3,6 and 9 .

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 1| January 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

DESIGN AND METHOD

The approach to research is the umbrella that covers the basic procedures for conducting research. The Quantitative approach was adopted for the study.

The research design selected for the study was quasi experimental pre-test-post test control group design.

The Design can be represented as follows:

C O1 O2

E O3 X O4

C: Patients with CKD who were receiving routine skin care managements

E: Patients with CKD who were received topical application of Avena Sativa

O1: Pre test in control group on the first day of observation

O2: Post test in control group on the eighth day of pre test

X: Topical application of one layer of oatmeal paste to the both lower limbs for 2 times a day for 7 days

O3: Pre test in experimental group on the first day of observation

O4: Post test in experimental group on the eighth day of intervention

DESCRIPTION OF INTERVENTION

Date	Activity	Time
First day of visit	A simple explanation of the procedure was given. Informed consent was taken socio personaland clinical data was collected.Pretest was done and scores were recorded and skin patch allergy test was done.	30 minute
Second day to seventh day of visit	The prepared spreadable paste was applied to the both lower limb of experimental group. After 30 minutes of application, rinse the area with cool water. This was applied for two times a day and was continued for 7 days.	30 minute
Eighth day of visit	Post-test was performed on the eighth day of intervention.	10 minute

DATA COLLECTION PROCESS

The research study duration was six weeks from 28-01-2020 to 07-03-2020. Screening of 100 subjects was done to select the samples who meet inclusion criteria. Sixty samples was selected using non-probability purposive sampling technique. Among the selected subjects, 30 subjects were then selected for experimental group and then as control group. Purpose of the study was explained to the participants and informed consent was obtained. The confidentiality of the collected data was assured. Socio personal data were collected using the socio personal data sheet which was filled by the patients and clinical data were collected using clinical data sheet which was filled by the investigator. Pre test was conducted by assessing uremic xerois,hyperpigmentation and pruritus on the first day of intervention and skin patch allergy test was done on selected group.Uremic xerosis was assessed by Modified El Gammal clinical score, hyperpigmentation was assessed by Felix von Luschan skin color chart and pruritus assessed using pruritus intensity assessment tool. On the first day of intervention patients who were not allergic to oat meal having the described cutaneous manifestations in the experimental group was topically applied with oatmeal paste to the lower limb for two times a day. This was continued for 7 days. Routine care was given to control group. The post test was done on the 8th day of intervention in both control and experimental group

FINDINGS

Descriptive statistics, frequency distribution and percentage were used to describe sample characteristics and Mann Whitney U test was used to determine the effectiveness of topical application of Avena Sativa on uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease. The data indicated that 40% of the patients in the control group and 43.4% in the experimental group were belonged to the age group of 56-65 years. Majority of the patients in the control (56.7%) and in the experimental group (60%) were males. The data revealed that majority of the patients in the experimental group (46.7%) had high school education and 40% of the patients in the control group and 36.7% patients in the experimental group had primary education. The data revealed that majority (46.7%) of subjects in control group had no occupation and 56.7% of subjects in the experimental group were self employed. Data pointed out that most of the patients (86.7%) in control group and (90%) in experimental group were married. The data indicated that half(50%) of the patients in the control group and experimental group had the support from spouse and children respectively

The data depicts that majority (43.3%) of the patients in the control group and in the experimental group (50%) had duration of disease1-<4years**.**Among 60 samples majority of the patients in control group (76.7%) and experimental group (53.3%) were having co morbidities of both diabetes mellitus and hypertension. The data reveals that majority of the patients in the control group (56.7%) had one dialysis per week and 50%of the patients in the experimental group had two dialysis per week**.** The data reveals that majority of the patients in the control group (63.3%) and in the experimental group (56.7%)had period on MHD less than one year.The data indicated that majority of the patients in the control group (33.3%) and in the experimental group (46.7%) had urine output above 325ml/day.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 1| January 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

Majority of the patients in the control group (70%) and experimental group (60%) had mild uremic xerosis and 30% of patients in control group had moderate uremic xerosis and in the experimental group 33.3% had moderate uremic xerosis and 6.7% of them had severe uremic xerosis.To find out the homogeneity of the sample, $\chi 2$ value was computed and it was found that control group and experimental group were homogeneous in the terms of pre test uremic xerosis. Data depicts that all the patients in the experimental group and control group had dark or brown type hyperpigmentation. Homogeneity of the sample were computed using $\chi 2$ value and it was found that control group and experimental group were homogeneous in terms of pre test hyperpigmentation. Majority of the patients in both control (66.7%) and experimental group (80%) had moderate pruritus. None of the subject in the control and experimental group had severe pruritus. To find out the homogeneity of the sample, $\chi 2$ value was computed and it was found that control group and experimental group were homogeneous in the terms of pre test pruritus.

The mean rank of post test scores of uremic xerosis among patients with chronic kidney disease in the control group is 40.03 and in the experimental group is 20.97. The obtained U value is 164 and it is significant at 0.001 level.There is statistically significant difference in the post test scores of uremic xerosis between the control and experimental group. It is interpreted that topical application of Avena Sativa is effective in reducing uremic xerosis among patients with chronic kidney disease (see table 1)

Table 1: Mean rank, sum of ranks and U value of post test scores of uremic xerosis among patients with chronic kidney disease in control and experimental group

(n=60)

Group	Uremic xerosis		
	Mean rank	Sum of ranks	U
Control (n=30)	40.03	1201	164***
Experimental (n=30)	20.97	629	

The mean rank of post test scores of hyperpigmentation among patients with chronic kidney disease in the control group is 37.30and in the experimental group is 23.7. The obtained U value is 246 and it is significant at 0.01 level. There is statistically significant difference in the post test scores of hyperpigmentation between the control group and experimental group. It is interpreted that topical application of Avena Sativa is effective in reducing hyperpigmentation among patients with chronic kidney disease (see table 2)

Table 2: Mean rank, sum of ranks and U value of post test scores of hyperpigmentation among patients with chronic kidney disease in control and experimental group

(n=60)

Group	Hyperpigmentation		
	Mean rank	Sum of ranks	U
Control (n=30)	37.30	1119	246**
Experimental (n=30)	23.7	711	

The mean rank of post test scores of pruritus among patients with chronic kidney disease in the control group is 38.77and that of experimental group is 22.23. The obtained U value is 202 and it is significant at 0.01level. There is statistically significant difference in the post test pruritus scores between the control group and experimental group. It is interpreted that topical application of Avena Sativa is effective in reducing pruritus among patients with chronic kidney disease. (see table 3)

Table 3: Mean rank, sum of rank and U value of post test scores of pruritus among patients with chronic kidney disease in control and experimental group

(n=60)

Group	Pruritus		
	Mean rank	Sum of ranks	U
Control (n=30)	38.77	1163	202**
Experimental (n=30)	22.23	667	

There is positive correlation between uremic xerosis and pruritus among patients with chronic kidney disease. The obtained Spearman correlation coefficient ρ is 0.56 and that is significant at 0.01 level.It is interpreted that pruritus increases with uremic xerosis.

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 1| January 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

Significant association was found out with uremic xerosis and duration of CKD at 0.01level.There was no significant association of uremic xerosis and selected variables such as education, occupation, comorbidities and number of dialysis per week

DISCUSSION

The main aim of the study was to assess the effectiveness of topical application of Avena Sativa on uremic xerosis,hyper pigmentation and pruritus among patients with CKD .The study findings reveals that topical application of Avena Sativa is effective in reducing pruritus among patients with chronic kidney disease. In a randomised controlled trial among 23 hemodialysis patients with uremic pruritus Avena sativa lotion significantly decreased the mean score of pruritus and verbal description($p<0.01$) (Gagnon AL) and clinical trial on Aveeno Skin relief moisturizing lotion among 54 patients with itching accompanied by skin lesions and xerosis reported that it is an effective moisturizing emollient that reduces pruritus in subjects with xerosis. ($p< 0.001$). (Michelle Garay M)

The present study reveals that there is positive correlation between uremic xerosis and pruritus among patients with chronic kidney disease, that is significant at 0.01 level. It is interpreted that pruritus increases with uremic xerosis.

The current study results were congruent with a clinical study of uremic pruritus on maintenance hemodialysis patients found that marked relationship was demonstrated between the intensity of xerosis and prevalence of pruritus. Significantly more patients with very rough skin had pruritus compared to those with rough skin ($p<0.05$) and those with slightly dry skin ($p<0.02$) (Szepietowski JC S. M.).

The present study explains that there was significant association was found out with uremic xerosis and duration of CKD.

The current study results were congruent with a study at a tertiary care centre regarding dermatological manifestations in chronic renal failure patients with and without hemodialysis The mean duration of the disease in dialytic patients was 32.9 months and that in the nondialytic patients was 11.2 months. Prevalence of xerosis was more in the dialytic group 36 (61.02%) compared to the non dialytic group 23 (38.98%), with statistically significant higher prevalence in the dialytic group with p value 0.014 (<0.05) (Chanda GM).

LIMITATIONS

Difficulties was there in making rapport with the patients and gain cooperation from them to perform the topical application as it is a newer therapy for the chronic dialysis patients.
Researcher faced drop out of 5 subjects during study due to acute worsening of their renal symptoms such as breathlessness, fluid overload etc
Long term effect of topical application of Avena Sativa was not assessed due to limited time.Randomization was not done due to limitation of time.

RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the present study, A long term study can be conducted to determine the long term effect of topical application of Avena Sativa among patients with chronic kidney disease The study can be replicated in various settings with larger sample to facilitate generalization of results. Similar complimentary therapies may be tried to relieve the cutaneous problems of patients with chronic kidney disease. A comparative study can be conducted to determine the effectiveness of different complimentary therapies on uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease. A similar study on effect of topical application of Avena Sativa on quality of life of patients with chronic kidney disease can be done. A true experimental study can be conducted by randomization of the sample.

NURSING IMPLICATIONS

The findings of the study serve as a scientific basis for the professional and students to conduct studies on cutaneous aspects of care among patients with chronic kidney disease. Nurses should introduce topical application of Avena sativa among patients with chronic kidney disease as a complementary, cost effective, safe and effective treatment modality in reducing uremic xerosis, hyperpigmentation and pruritus.

Nurses who are caring the patients with chronic kidney disease can plan, implement and evaluate the topical application of Avena Sativa during hospitalization for reducing uremic xerosis, hyperpigmentation and pruritus.Topical application of Avena Sativa can be implemented to long term care settings for chronic renal disease patients.

CONCLUSION

The study on effectiveness of topical application of Avena Sativa on uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease was a successful research work. Based on the findings of the study the following conclusions were drawn. Patients with chronic kidney disease stage V had uremic xerosis, hyperpigmentation and pruritus.Topical application of Avena Sativa was effective in reducing uremic xerosis, hyperpigmentation and pruritus among patients with chronic kidney disease. There was statistically significant positive correlation between uremic xerosis and pruritus and there was a statistically significant association between uremic xerosis and duration of CKD. The topical application of Avena Sativa reduces these cutaneous manifestations and improves the quality of life among patients with chronic kidney disease

ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 10| Issue: 1| January 2024|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2023: 8.224 || ISI Value: 1.188

REFERENCE

1. *Chanda GM, C. S. Dermatological manifestations inchronic renal failure patients with and without hemodialysis A study at a tertiarycare cetre. Journal of Dr. NTR University of Health Sciences.*
2. *Couser WG, R. G. The contribution of chronic kidney. Kidney International.*
3. *Gagnon AL, D. T. dermatological diseases in patients with chronic kidney disease. Journal of nephropathology.*
4. *Michelle Garay M, J. N. Antiinflammatory activities of colloidal oatmeal (Avena sativa) contribute to the effectiveness of oatsin treatment of itch associated with dry, irritated skin. . J Drugs Dermatol.*
5. *Nakhaee S, N. A. Comparison of Avena sativa, vinegar,and hydroxyzine for uremic pruritus of hemodialysis patients: a crossover. Iranian journal of kidney diseases.*
6. *Szepietowski JC, B. E. Uraemic Xerosis. Actadermato-venereologica.*
7. *Szepietowski JC, S. M. Uremic pruritus: a clinical study of maintenance hemodialysis patients. The Journal of dermatology.*
8. *Nigam, A. K., Singh, G., Singh, N., & Parihar, A. Dermatological Manifestations in Patients of Chronic Kidney Disease.*
9. *Asokan, S., Narasimhan, M., & Rajagopalan, V. (2017). Cutaneous manifestations in chronic renal failure patients on hemodialysis and medical management. International Journal of Research in Dermatology, 3(1), 24.*
10. *Szepietowski, J. C., Reich, A., & Schwartz, R. A. (2004). Uraemic xerosis. Nephrology Dialysis Transplantation, 19(11), 2709-2712.v*
11. *Mettang, T., & Pauli–Magnus, C. (2000). The pathophysiological puzzle of uremic pruritus—insights and speculations from therapeutic and epidemiological studies. Peritoneal Dialysis International, 20(5), 493-494.*
12. *Cordova, K. B., Oberg, T. J., Malik, M., & Robinson-Bostom, L. (2009, January). Dermatologic conditions seen in end-stage renal disease. In Seminars in dialysis (Vol. 22, No. 1, pp. 45-55). Oxford, UK: Blackwell Publishing Ltd.*
13. *Pacifico, A., De Angelis, L., Fargnoli, M. C., De Felice, C., Chimenti, S., & Peris, K. (2005). Clinical trial on Aveeno Skin Relief Moisturizing Lotion in patients with itching accompanied by skin lesions and xerosis. Journal of applied research in clinical and experimental therapeutics, 5(2), 325.*