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PREVELANCE OF UREMIC PRURITUS AMONG CHRONIC RENAL FAILURE PATIENTS WHO ARE ON HEMODIALYSIS – A CASE REPORT

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ABSTRACT
Uremic pruritus (UP) is also called as chronic kidney disease associated pruritus .Pruritus, or itch, is a common problem for patients with chronic renal failure. However recent survey including the dialysis outcomes and practice pattern study has assessed that more than 42-50% of the hemodialysis patients affected by uremic pruritus (UP) .The statistics shows that (UP) remains an important clinical symptom and health issue in CKD patients. Among the dermatological abnormalities associated with end stage renal disease uremic pruritus is most prevalent and common among all the patients who are under hemodialysis. It is a distressing symptom which has a role in reducing the quality of life among hemodialysis patients. The primary cause for (UP) among the hemodialysis patient is uraemia, electrolyte imbalance, skin mast cell proliferation, and hyperthyroidism and iron deficiency anaemia. The site which is commonly affected by the (UP) is back of limbs, chest and back of neck regions. UP often leads to mechanical skin damage as a result of continuous scratching the superficial skin with excoriations and super imposed infections. Heat stress, hyperhydrosis showers aggravate the symptoms of (UP).The occurrence, duration and intensity of (UP) has diurnal variations as that symptoms become worse in night time. The adverse effect of (UP) includes abdominal discomfort, anxiety, depression and insomnia. Prolonged insomnia causes fatigue which influences the resist of mental and physical activity. Recommended remedies far (UP) include optimization of frequency of dialysis, regular Epo-dosage, discarding the dialyzer in 4-5th use.

INTRODUCTION

Uremic Pruritus (UP) is a common condition observed in most of the dialysis patients and it is not a life threatening emergency among the dialysis patients. The underlying the mechanism which favours the (UP) is Azotemia, anaemia, metabolic acidosis, hypocalcaemia, hyperkelemia, hyperphosphatemia, and immune related complexes. The major factor contributes the prevalence of (UP) is increased in inflammatory response and prolonged heparin usage during dialysis. The pathophysiology of (UP) is complex of both uremic and non uremic factors [1].

Patho-physiology of Uremic Pruritus

In the past 35 years different hypotheses about (UP) have been generated. The most prominent concept is focused on parathyroid hormone (PTH) because (UP) seems to be most severe in patients with marked hyperparathyroidism and resolved after parathyroidectomy. Hyperparathyroidism can stimulate mast cells to release histamine and it can promote micro precipitation of calcium and magnesium salts in the skin. The secondary factor is precipitated calcium phosphate crystals in the

setting of elevated serum calcium and phosphate levels as a responsible event in (UP). A number of different mechanisms have been proposed to explain the origin of uremic pruritus, but none are completely convincing. Xerosis is the most frequent dermatological manifestation in patients undergoing dialysis therapy.

Xerosis may represent atrophy of sweat or sebaceous glands makes impairment of their function of external secretion. Less hydration in stratum corneum increases the prevalence of Uremic Pruritus (UP) in hemodialysis. Multiple factors have been proposed as pruritogenic substrates among them vitamin A, parathyroid hormone, histamine and divalent ions may have the potential for inducing itching.

Histamine, mainly released by skin mast cells, basophiles, platelets, and bronchial mast cells, is well known as a trigger of itching in allergic skin conditions. Plasma levels of histamine have been reported to be elevated in uremic patients. The correlation between histamine and uremic pruritus was not clear because flare reactions causes atrophy of sebaceous gland, and sweat gland and sweat are more in decreased BUN patients develops Xerosis which leads to impaired sweat secretion and stratum correum which stimulates c-nerve fibres leads to increase in inflammatory response.

When compared with females, males have a higher prevalence of uremic pruritus, because of high BUN, B2-microglobulin, calcium and phosphate as well as I-PTH is closely associated with (UP). The minor central mechanism involved is skin scratching stimulates large, myelinated, fast conducting afferent nerve which turn regulates the pain through dorsal horn cells by synaptic mechanism. Serum inflammatory biomarker such as I L-4, IL-6, and C-reactive and S-reactive protein is elevated in chronic renal failure patients [2,3].

Causes for Uremic pruritus in hemodialysis patients [4,5].

1. Dry skin
2. Liver disease
3. Abnormal metabolism of calcium and phosphorus/raised parathyroid hormone
4. Accumulation of toxins(azotemia)
5. Sprouting of new nerves
6. Systemic inflammation
7. Diabetes mellitus

Presentation of Uremic pruritus in hemodialysis patients

Uraemic pruritus is characterised by daily bouts of itching that tend to worsen at night. The itch may be generalised or localised to one area, most often seen in abdomen, head and in arms. In haemodialysis patients, the pruritus is lowest on the day after dialysis and peaks 2 days after dialysis. The skin may appear normal or dry with few to numerous scratch marks and picked sores.

Effect of Uremic Pruritus on various systems

Patients may report non-specific symptoms. Which become chronic and progressive over time because of the gradual onset of the disease. Metabolic abnormalities such as anaemia, acidemia and electrolyte abnormalities are prominent.

Cardiovascular complications

Cardiovascular abnormalities such as hypertension, atherosclerosis, valvular stenosis, congestive heart failure, and angina accelerate as result renal function declines.

Gastrointestinal complications

Occult GI bleeding may occur. Nausea and vomiting are common in patients with severe uraemia Pruritus. Uremic fetor (ammonia or urine like odour to the breath) also may be present.

Neurologic complications

Symptoms of uremic encephalopathy include fatigue, muscle weakness, malaise, headache, restless legs, asterixis, polyneuritis, mental status changes, muscle cramps, seizures, stupor, and coma. Amyloid deposits may result in medial nerve neuropathy, carpal tunnel syndrome, or other nerve entrapment syndromes.

Extremities

Fluid retention, pruritus associated with calcium phosphate deposition, and nail atrophy are commonly seen in persons with Uremic Pruritus.

Treatment

Tropical treatment

1) Skin emollients such as capsaicin cream are used to hydrate the stratum correum. Other tropical applications performed are polidoconal oil, safflower oil, olive oil, primrose oil. These oil contains natural lipids and endocannabinoids capsaicin reduce level of substance P in cutaneous type C nerve endings

2) Tacrolimus ointment is used for the treatment of moderate to severe atopic dermatitis in adults and children who have normal immune systems. The 0.1% concentration of tacrolimus ointment is approved for the treatment. It binds to a receptor within the cell called the FK binding proteins. This drug-protein complex inhibits calcineurin (a calcium-dependent phosphatase transmitting chemical) that in turn reduces the activity of T-lymphocytes in the immune system. As a consequence, T-cells fail to release their cytokines it suppresses the production of interleukin receipts [6,7].

Systemic Treatments

1. Ultraviolet light therapy, IV erythropoietin and opiod receptor antagonist
2. Gabapentin 100-350 mg after the end of dialysis session reduces the severity of (UP). Gabapentin is used primarily to treat seizures and neuropathic pain. The possible side effects such as dizziness, coma, somnolence, fatigue and nausea can occur.
3. 5 HT3 antagonist ondansetron is effective in most of the (CKD) patients reduced the frequency of itching.
4. Oral activated charcoal has more benefits in reducing itching among the CKD patients.
5. Immune modulator such as thalidomide reduces the (UP) by 80%.
6. Intravenous administration of heparin, lidoline, microgoline reduces the itching up to (60-65%) during the hemodialysis session [8-10].

CONCULSION

By controlling the trigger factors such as uremic and non-uremic factor (UP)can be controlled by increasing the efficacy of dialysis, regular erythropoietin therapy, low salt diet, reduces the incidence of (UP) among the patients. Many tropical and systemic applications improve the quality of life among the chronic renal failure patients. Regular monitoring of parathyroid activity and electrolytes decreases the risk of prevalence of (UP)

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REFERENCES

1. Anderson SR. (1971). Ethylene oxide toxicity. *Lab Clinic Med*, 77, 346–356.
2. Simon P, Potier J, Thebaud HE. (1996). Risk factors for acute hypersensitivity reactions in hemodialysis. *Nephrologist*, 17, 163–170
3. Samuels TM. (1982). Ethylene oxide. *Hosp Top*, 60, 33.
4. Marshall C, Shimizu A, Smith EK, Dolovich J. (1984). Ethylene oxide allergy in a dialysis center, prevalence in hemodialysis and peritoneal dialysis populations. *Clin Nephrol*, 21, 346–349
5. Caruana RJ, Hamilton RW, Pearson FC. (1985). Dialyzer hypersensitivity syndrome, possible role of allergy to ethylene oxide. Report of 4 cases and review of the literature. *Am J Nephrol*, 5, 271–274
6. Chang CC, Gershwin ME. (1992). Perspectives on formaldehyde toxicity, separating fact from fantasy. *Regul Toxicol Pharmacology*, 16, 150–160.
7. Lemke HD. (1987). Mediation of hypersensitivity reactions during hemodialysis by IgE antibodies against ethylene oxide. Artif Organs, 11, 104–110.
8. Masin G, Polenakovic M, Ivanovski Atanasov N, Olivera S, Cakalaroski K. (1991). Hypersensitivity reactions to ethylene oxide, clinical experience. *Nephrology Dial Transplant*, 6(3), 50–52.
9. Salem M, Ivanovich PT, Ing TS, Daugirdas JT. (1994). Adverse effects of dialyzers manifesting during the dialysis session. *Nephrol Dial Transplant*, 9(2), 127–137.
10. Ing TS, Ivanovich PT, Daugirdas JT. (1987). First-use syndrome and hypersensitivity during hemodialysis, some pieces of the puzzle are falling into place. *Artificial Organs*, 11, 79–81.