

Case Report

A case report on Kyrle's disease in patient with diabetes mellitus

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ABSTRACT

Kyrle's disease classified under acquired perforating dermatosis, is a rare skin condition predominantly affecting 30-50-year-old females. Characterized by pruritic hyperkeratotic and ulcerated nodules, the disease involves the transepidermal clearance of aberrant endogenous components, leading to inflammatory reactions and expulsion of keratin and cellular material. The etiology though not fully understood, suggests changes in dermal connective tissue may play a role. In case report, a 56-year-old male with type II diabetes mellitus presented knee pain and 3 mm papules on lower limbs. Laboratory findings revealed hematological and metabolic abnormalities, and a skin biopsy confirmed Kyrle's disease features. Laboratory reports indicated abnormalities in hematology, blood glucose, lipid profile, hepatic and renal function. Biopsy results confirmed acanthosis, hyperkeratosis, dysplasia and granulomatous inflammation. The association of Kyrle's disease and metabolic abnormalities, emphasizing diabetes and chronic renal failure. Potential pathways involve oxidative damage, endoplasmic stress, and vasculopathy. Treatment options include keratolytics, emollients, antihistamines. Kyrle's disease often linked to diabetes and chronic renal failure, is a chronic condition with variable remission periods. Early detection and appropriate management are crucial for improving patients' quality of life. Understanding the association with metabolic abnormalities guides effective therapeutic approaches for this rare dermatological condition.

Keywords: Kyrle's disease, Diabetes mellitus, Chronic renal failure, Hyperkeratosis

INTRODUCTION

Kyrle's disease is a rare skin illness that is differentiated as a subtype of acquired perforating dermatosis. Together with reactive perforating collagenosis, elastosis perforans serpiginosa, and perforating folliculitis.¹ The exact cause of Kyrle's disease is unknown, but there has been evidence of a correlation between it and renal problems, uremic dialysis patients, diabetes mellitus, liver disease, paraneoplastic syndromes, tuberculosis, and some fungal diseases.² Transepidermal clearance of abnormal endogenous components is a unique feature of this rare type of primary perforating condition. On the extensor surface of the upper and lower limbs and on the trunk, the condition mainly affects females age 30 to 50. It appears as pruritic hyperkeratotic and ulcerated nodules and

papules with a central keratotic plug.³ The most widely accepted theory suggests the disease brings on by the transepidermal loss of keratin and other components of cells.⁴ Rather than the normal growth with keratinization higher in the epidermis, keratinization occurs focally in the epidermal basilar layer. As a result, the host undergoes an inflammatory response that drives keratin, cell waste, and connective tissue through the epidermis and out of the skin. An inflammatory reaction could probably arise from a shift in the dermal connective tissue.⁵ In addition to Kyrle's disease, other perforating dermatoses which are caused by chronic renal failure and/or diabetes mellitus include elastosis perforans serpiginosa (EPS), perforating folliculitis (PF), and acquired perforating collagenosis (APC).² The transepidermal elimination (TEE) of dermal substances, mainly collagen in APC, keratin in Kyrle's

disease and PF, or greater elastic fibers in EPS, is believed to be the pathophysiological mechanism behind these diseases. Yet characteristics could vary and the TEE material's composition might consist of keratin, elastin, and collagen.³

CASE REPORT

A 56-year-old male patient presented to the Department of General Medicine, Government General Hospital, Kadapa, with the primary complaint of pain in both knees for the last two months and a 3 mm papule on both lower limbs. He has a history of type II diabetes mellitus and has been on metformin 500 mg and sitagliptin 150 mg for the past 20 years. The follow up was conducted after two weeks of the hyper keratinization was reported.

Investigations

The laboratory reports were as given in Table 1.

Table 1: Laboratory reports.

Parameter	Observed value
Haemoglobin	13.3 gm %
Total count	7000 cells/cumm
Differential count	
Neutrophils	60%
Lymphocytes	32%
Eosinophils	6%
Monocytes	2%
ESR	15 mm/hour
Platelets	2 lakh/cumm
RBS	314 mg/dl
FBS	107 mg/dl
PPBS	125 mg/dl
Serum calcium	10 mg/dl
Total cholesterol	126 mg/dl
Tryglycerides	74.2 mg/dl
AST	24 units/l
ALT	22 units/l
Uric acid	4.4 mg/dl
Creatinine	0.89 mg/dl
TSH	4.270 µIU/ml
Vitamin B12	741.7 pg/ml
Vitamin D,25 hydroxy	33.4 ng/ml

Biopsy report

Sections of skin biopsies indicate acanthosis, hyperkeratosis, and a localised region of moderate dysplasia in the epidermis, and granulomatous inflammation in the dermis. Follicular or extra follicular cornified plug is not identified (Figure 1).

Based on the aforesaid symptoms and laboratory findings, the patient was diagnosed with Kyrle's disease and was treated accordingly with tablet cetirizine 5 mg

OD, glycerine lotion for both lower limbs, ointment salicylic acid with betamethasone over the lesions, and capsule A&D OD.

Two weeks after that, a follow-up was done. Although not prevented, the patient's condition was within control. This could suggest that keratinization was under control when diabetes mellitus had been controlled.



Figure 1: Left limb showing papule and granulomatous inflammation.

DISCUSSION

The association between Kyrle's illness and metabolic abnormalities in individuals likely to be significant. Less commonly, cases of isolated diseases onset have been reported. Diabetes is the most common metabolic disorder associated with Kyrle's. However, occur in people with poor renal function (it is believed that 10% of dialysis patients the condition), liver disease, or congenital cardiac disease.⁷ There is likely a strong correlation between Kyrle's disease and deviations in an individual's metabolism. Cases of isolated illness onset have been reported less frequently. The most common disease linked to Kyrle's is diabetes. Still, happen to those who have impaired renal function (about 10% of dialysis patients), congenital heart disease, or liver disease.⁸ The pathogenesis of diabetes mellitus is unknown, but it may arise from changes in the dermis or epidermis that cause metabolic disturbances, a cutaneous reaction to superficial trauma, and vasculopathy caused on by endoplasmic stress or products of oxidative damage like oxidized low-density lipoprotein and advanced glycation end products.⁹ A study of 22 PD patients found that 50% had diabetes and 72% had chronic renal failure. 90% percent of PD and diabetic patients experienced chronic renal failure. 19 of the 21 KD cases in the report had a renal condition, and 12 had diabetes.¹⁰ As first-line treatment options, keratolytics such urea or salicylic acid are used. Pruritus has been treated with oral emollients and antihistamines. In addition to ultraviolet A radiation, alternative therapies include electrocautery, cryotherapy, CO₂ laser, topical retinoids, isotretinoin, and psoralen. It has also been shown that oral clindamycin 300 mg three times a day for one month.¹

CONCLUSION

Kyrle's disease is a rare clinical manifestation in patients with diabetes mellitus and chronic renal failure. It is a chronic condition with periods of remission and aggravation. Early detection and differentiation of lesions and their management is necessary to improve the quality of life of the patient. Understanding the association with metabolic abnormalities guides effective therapeutic approaches for this rare dermatological condition.

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