

## Original article

# Morphological changes of fingernail lunula in chronic renal failure on hemodialysis : An observational study

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### Abstract:

**Background:** The lunula represents the visible portion of the distal nail matrix that extends beyond the proximal nail fold. It is a white and crescent shaped area seen just distal to the proximal nail fold. Abnormalities of the morphology of the lunula can be a manifestation of a primary nail dystrophy or a finding associated with underlying systemic disease. Chronic renal failure and hemodialysis cause various nail pathologies. This study intends to find the various morphological changes of lunula associated with chronic renal failure in patients on hemodialysis.

**Materials and methods:** An observational study of morphological changes of fingernail lunula was done on patients with chronic renal failure on hemodialysis at the Dialysis centre, MIMS, Mandya. All patients were examined for lunular changes and patients with the changes were included in the study. Patients with onychomycosis, handicap, congenital nail dystrophies and those unwilling to sign the consent form were excluded. The lunula was measured from the midpoint of proximal nail fold to the distal curved edge.

**Results:** A total of 74 CRF patients on dialysis were examined. Fifty one (68.9%) patients had one or more nail changes. Among them 24(32.4%) patients had lunular changes (Table 1). 18/24(75%) patients had anolunula and 6/24(25%) patients had lunula in all the fingernails. Red lunula is seen in one patient (4.2%).

**Conclusion:** Nail disorders are most common in hemodialysis patients. Among the lunular changes, majority of patients had anolunula (3/4th) and a few of them(1/4<sup>th</sup>) had presence of lunula in all nails.

Keywords: Lunula, Nail, Chronic renal failure

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### Introduction:

The lunula represents the visible portion of the distal nail matrix that extends beyond the proximal nail fold.<sup>1</sup> It is present by 13 weeks of gestation when the matrix primordium gives rise to the developing matrix.<sup>2</sup> The lunula is a white and crescent shaped area seen just distal to the proximal nail fold. It is believed to be responsible for the shaping of the free edge of the nail plate.<sup>3</sup> The white color of the lunula is due to the diffraction of

the light produced by the keratogenous zone of the distal matrix containing nuclear fragments and the lesser visibility of nail matrix capillaries.<sup>4</sup> The lunula is not visible on all fingers and toes, but is consistently observed on the thumb, index finger and the great toe. Abnormalities of the morphology of the lunula can be a manifestation of a primary nail dystrophy or a finding associated with underlying systemic disease.<sup>1</sup> Chronic renal failure is known to cause various nail pathologies. They

may be directly related to the renal condition itself or its complications or to the therapy.<sup>5</sup> This study intends to find the various morphological changes of lunula associated with chronic renal failure.

#### **Materials and methods:**

An observational study of morphological changes of fingernail lunula was done on patients with chronic renal failure on hemodialysis at the Dialysis centre, MIMS, Mandya between November 2015 – January 2016. All the patients diagnosed with chronic renal failure attending the Dialysis centre were examined for fingernail changes. Patients with onychomycosis, handicap, congenital nail dystrophies and those unwilling to sign the consent form were excluded. Morphological changes of lunula like color, size and other changes were noted in all patients. Size of lunula was measured from the midpoint of proximal nail fold to the distal curved edge.

**Results:** A total of 74 CRF patients on dialysis were examined. Fifty one (68.9%) patients had one or more nail changes. Among them 24(32.4%) patients had lunular changes (Table 1). 18/24(75%) patients had anolunula and 6/24(25%) patients had lunula in all the fingernails. Red lunula is seen in one patient (4.2%). The other nail changes seen were half and half nails followed by white nails and platynychia.

#### **Discussion:**

Chronic renal failure is known to cause a variety of nail pathologies. Previous studies have reported nail changes among renal failure ranging from 52% to 71%.<sup>6-9</sup> Present study is similar to other studies reported in literature. Several studies have reported lunular changes as the most frequent nail changes

in patients undergoing hemodialysis. It ranged from 16.4% - 62.9% and the most common change observed was an absent lunula (Figure 1).<sup>7,8,9,10</sup> In present study lunular changes is seen in 24(47.1%) patients (Table 1). Saray et al. reported absent lunula as the most frequent abnormality (31.9%) in their study and suggested that it reflected a variety of conditions in dialysis patients, including metabolic disorders and anemia.<sup>8</sup> Also, opined anolunula is more likely to be related to conditions present in chronic renal failure rather than being a result of hemodialysis. Anolunula was seen in 17 (23%) patients in present study and accounts for more than 2/3<sup>rd</sup> of lunular changes.

Six patients had lunula in all the fingernails (Figure 2). This finding is unique in this study. So far no studies have delineated this association. Macro lunula is due to large matrix which is common to thumb, whereas visible lunula in all fingers without large nail matrix/plate is unusual finding in this study.

Red lunula (Figure 3) is noted in one patient. Systemic diseases associated with red lunula are rheumatoid arthritis, systemic lupus erythematosus, cardiac failure, hepatic cirrhosis, lymphogranuloma venereum, pulmonary disease, carbon monoxide poisoning, among others. Dermatological condition showing red lunula are chronic urticaria, psoriasis vulgaris, lichen sclerosis and atrophic or alopecia areata. But none of the cases have been described in literature to be associated with chronic renal failure.

Several previous studies have demonstrated that the prevalence of nail disease increases with hemodialysis duration;<sup>6,9</sup> however in present study this association could not be ascertained because of lack of patient observation of the lunular changes.

**Table 1: Lunular changes in patients with CRF on hemodialysis**

	Male	Female	Avg duration of renal disease	Avg duration since hemodialysis
Anolunula	10	7	21 ( 9 - 47 months)	9 ( 1 - 41 months)
Lunula in all the fingernails	3	3	20 (14-29 months)	11 ( 3 - 19 months)
Red lunula	1	0	24 months	4 months

Figure 1: Absent lunula in both thumbs



Figure 2: Lunula in all fingers



Figure 3: Red lunula

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