



## Possible Role of Renal Tubular Epithelial Cells (RTEC) in no Inflammatory Nephropathy

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### Abstract

*Present study relates to results of urinalysis of 3 patients. Microscopic examination of urine sediments revealed large number of renal tubular epithelial cells (RTEC). In addition, 1 of 3 cases also had significant mild albuminuria (10 mg/dl). Findings were suggestive of mild renal tubular injury.*

### Introduction

Renal tubules consist of proximal and distal tubules. Proximal tubules are relatively longer and more conspicuous compared with distal tubules. Furthermore, proximal tubules are lined by epithelial cells with brush border having microvilli. Later structures provide a large surface area for salt and water reabsorption<sup>1</sup>. Renal tubular epithelial cells (RTEC) appear to be preferred targets for certain toxins. In addition, RTEC have high rate of O<sub>2</sub> consumption which further makes them susceptible to tubular injury<sup>1</sup>. Injury to RTEC leads to their excessive loss and focal denudation of tubular basement membrane. Present study relates to detection of large number of RTEC in urine sediments of 3 patients.

### Selection criteria

Results of routine examination of urine samples from 1644 subjects with urinary complaints revealed detection of RTEC in urine samples of 35 subjects. Thirty two of 35 subjects also had pus cells. Later, these 32 subjects were excluded from this study (figure 1).

### Case Study

Present study relates to the results of urinalysis of 3 patients. Age of the patients ranged from 28 to 34 (median 29) years. All the patients were females. The patients had large number of RTEC in their urine deposits. Table 1 shows the results of urinalysis of 3 patients. As it will appear, one of the patients also had mild proteinuria (proteins

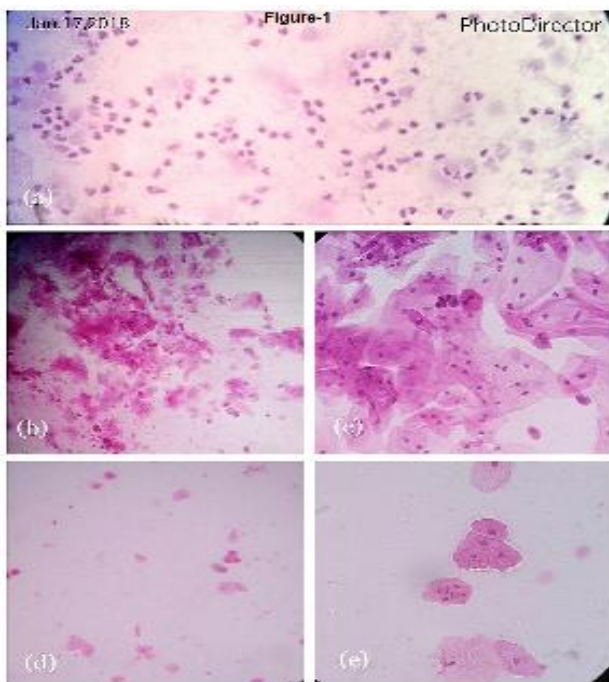
10 mg/dl) along with large number of RTEC in urinary sediments. Smears were stained by

conventional hematoxylin eosin method.

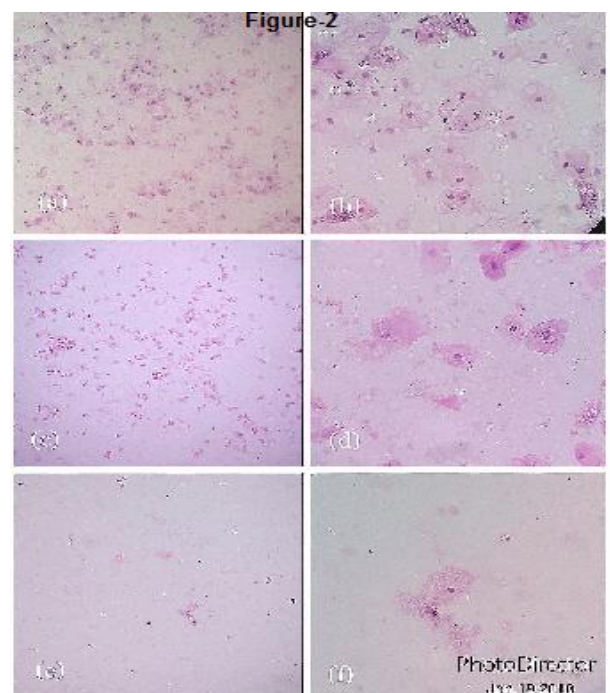
**Table 1:** Urinalysis of patients with large number of renal tubular epithelial cells (n = 3).

Case No.	Patient ID	Age in years	Sex	Renal tubular epithelial cells	Pus cells	RBC	Sugar	Protein mg/dl	pH
1	10130949	34	F	5+	-	-	-	-	6.5
2	10131587	29	F	3+	-	-	-	10	6.5
3	10139236	28	F	4+	-	-	-	-	7.5

Abbreviations: 3+ = 11 to 15 cells/hpf, 4+ = 16 to 20 cells/hpf, 5+ = >20 cells/hpf, F = female



**Figure 1** (a) showed large number of neutrophils and pus cells in urine sediment of a subject (HE × 100). (b) showed neutrophils and renal tubular epithelial cells (RTEC) in centrifuged deposit of another subject (HE × 100). (c) High power magnification of urine deposit of previous subject (HE × 450). (d) Urine deposit view showing few neutrophils sticking on the surface of infected epithelial cells (HE × 100). (e) Higher magnification of urine sediment of previous subject (HE × 450). Subjects with pus cells in urine deposit were excluded from the present study.



**Figure 2** (a), (c) and (e) showed lower magnification of urine deposits from 3 patients included in this study (HE × 100). (b), (d) and (f) showed higher magnification of urine deposits of patients which were included in present study (HE × 450).

**Discussion**

Most important feature of this study was the detection of large number of RTEC in urine sediments of 3 patients. Moreover, one of 3 patients also had mild proteinuria. Loss of large number of RTEC in urine and mild proteinuria suggested possible injury to tubular epithelium. Absence of leucocytes and pus cells in centrifuged urine deposits of 3 patients suggested role of non-inflammatory agents in pathogenesis of tubular

nephropathy. Nonbacterial factors, e.g. exogenous toxins and immunological and metabolic dysfunctions appear to be involved in loss of large number of RTEC in urine sediments<sup>2</sup>. In addition, interrupted blood flow or ischemia might have contributed to renal injury and loss of tubular epithelial cells<sup>3</sup>. Moreover, proximal tubular injury may also lead to mineral bone disorder and anemia<sup>4</sup>. Furthermore, RTEC appeared to form a barrier between the host and ascending urinary tract infection<sup>5</sup>.

### Conclusion

Present study relates to the results of urinalysis of 3 patients having renal tubular epithelial cells (RTEC) in urine sediments. One of the patients also had mild proteinuria. Significant mild proteinuria in association with loss of large number of RTEC suggested mild tubular nephropathy.

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