

# Urine Cytology in Patients with Long Standing Dialysis

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## Abstract

**Background:** Dialysis is in common use to treat patients with end stage renal failure. However longstanding dialysis harboring some cellular changes in various body fluids. This study was conducted in order to detect these changes in urine.

**Objective:** The study was conducted to detect cellular changes in urine of patients with longstanding dialysis.

**Method:** Fifty-three urine samples were examined cytologically obtained from patients with longstanding dialysis during 6 months period. Freshly voided midstream urine samples were taken. Samples were centrifuged and 2 to 3 drops of sediments were smeared on 2 glass slides and fixed in 95% ethyl alcohol then stained with Hand E stain to be evaluated.

**Results:** Gross physical examination of all urine samples were neither purulent nor hemorrhagic. Microscopically there was increased exfoliation of urothelial cells except in 9 cases. No significant cytological atypia were seen in all urine samples. Excessive exfoliation in the absence of significant inflammation, hemorrhage and cytological atypia compared with control group.

**Conclusion:** The study revealed that some cytological changes do occur in the urothelial cells of patients with longstanding dialysis. These changes need further attention and study to disclose their causes.

**Key words:** Urine cytology, dialysis.

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## Introduction

For more than 100 years, urine cytology have been done for several reasons including searching for tumor cells. Sanders first identified such cells in urine in 1864<sup>(1)</sup>. Dialysis is in common use to treat patients with end stage renal failure regardless the underlying etiological causes. Very little is known about the cellular changes of various body fluids including urine cytology induced by longstanding dialysis continuous for more than 6 months. Therefore we carried out this study to analyze the microscopic morphology of exfoliated urothelial cells in urine samples of patients with longstanding dialysis; to determine whether these cellular changes were related to the long duration time of dialysis and to compare these cells with the cells from nondialysis group.

## Methods

Thirty seven urine samples were taken from patients with long standing dialysis (more than 6 months) regardless of the underlying etiological causes at Dialyzing Unit /Kadimya Teaching Hospital during the period starting from January 2002 to July 2003. Those urine samples were compared with 16 urine samples taken from healthy control group. The age range was from 36 to 67 years with a mean age of 52.3 years. Male to female ratio was 1.3:1. Samples were collected randomly through spontaneous passage of freshly voided midstream urine during the day, excluding early morning samples and samples from patients with inflammatory conditions. The samples were put into conical disposable glass tubes

and centrifuged for 15 minutes at 3000 rpm /minutes. The supernatant liquid was decanted and 2 to 3 drops of the sediment were smeared on two glass slides, fixed in 95% ethyl alcohol for 30 minutes and then stained by Haemtoxyllin and Eosin stain. All the preparations were analyzed and evaluated cytologically for this study.

## Results

The gross physical appearances of all urine samples were neither purulent nor haemorrhagic **Table-1**.

Urine analysis showed the following predominant microscopically changes:

Increased exfoliation of urothelial cells, arranged both singly and in clusters on a clear background except in 9 cases (6 of them showed significant RBCs while the remaining 3 cases showed lymphocytic infiltrate). No significant cytologic atypia were seen in all urine samples Examined **Table-2, Figure-1** and **Figure-2**. The most remarkable features in urine samples taken from patients with long standing dialysis were excessive exfoliations and mixed pattern urothelial cells arrangement in the absence of significant inflammation, haemorrhage and cytological atypia compared with control group (p value < 0.05).

## Discussion

Long standing ambulatory dialysis is in common use to treat patients with end stage renal failure. Very little known about cellular changes of body fluids induced by long term dialysis<sup>(1, 2, 3, 4, 5, and 6)</sup>. To our

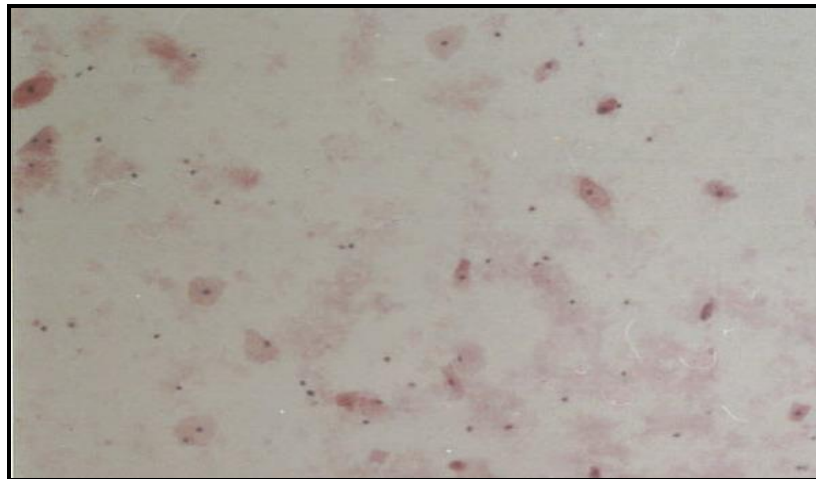
knowledge no previous published reported papers studied this subject. Therefore we carried out this study to analyze the microscopic morphology of exfoliated urothelial cells in urine samples of patients with long standing dialysis excluding patients with any associated significant lesions and other causes of simple reactive urothelial hyperplasia like inflammatory conditions , chronic irritation and significant haematuria<sup>(7,8,9,10)</sup>. Those results were compared with nondialysing control group. Those

microscopical morphological urothelial cellular changes noted in the present study were most likely due to the toxic effect of chronic uremia on the urothelial cells lining or it could be due to the dialysate technique itself as well as the duration time of dialysis. However a further advanced study is needed to confirm it<sup>(8, 10, 11, 12, and 13)</sup>. The pathologist needs to be aware to these changes and to include the list of other conditions that cause reactive cellular urothelial shedding.

*(Table-1)*  
*Urine Color in Dialyzing and Nondialyzing Control Groups*

Control group		Dialyzing group		Urine Colors
%	no.	%	no.	
62.5	10	0	0	Yellow
25	4	0	0	Straw color
12.5	2	100	37	Deep orange

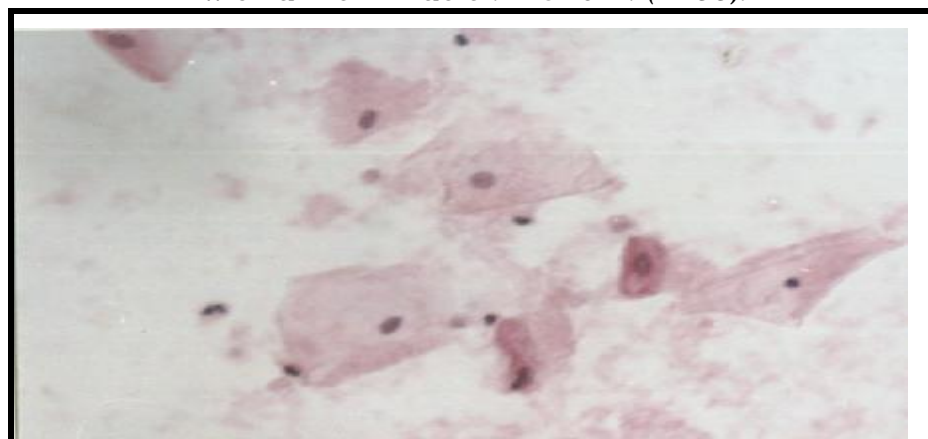
*(Figure-1)*  
*Smear Showing Excessive Cellular Shedding Of Benign Urothelial Cells On A Clear Background. H and E. (X100).*



(Table- 2)  
Microscopic Urine Examination in Long Standing Dialyzing Patients  
Compared with Control Group

Microscopic Examination	Dialyzing Group			
	no	%	no	%
<i>Background</i>				
Significant RBC	6	16.2		
Significant inflammatory cells			0	0
Lymphocytic	3	8.1		
Neutrophilic	0	0		
<i>Overall cellularity</i>				
No. of cells/HPF			16	100
Low(0-1)	0	0	0	0
Moderate(2-6)	6	16.2	0	0
High(6 & more)	31	83.8		
<i>Urothelial cells arrangement</i>				
Predominantly singly	7	18.9	16	100
Clustered of various sizes	1	2.7	0	0
both	29	78.4	0	0
<i>Cytological atypia including:</i>				
Nuclear position,				
Nuclear membrane				
Nuclear size and irregularity				
No. of nucleoli ,chromatin pattern and mitotic figure				
			No significant cytological atypia	

(Figure- 2)  
Smear showing excessive cellular shedding of benign urothelial cells  
with uniform nuclei. H and E. (X400).



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