

URINE CYTOLOGICAL CHANGES IN HIV POSITIVE SUDANESE PATIENTS

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ABSTRACT

Background: This is descriptive study was conducted at Khartoum State during the period from January 2012 to July 2012. The aim of this study was to determine the cytological findings in urine from HIV positive Sudanese patients. **Methods:** Samples were collected from HIV Clinic in Bashaier Hospital; Urine cytological smears were prepared at Faculty of Medical Lab Sciences, University of Medical Sciences and Technology. Urine samples were collected from 59 HIV positive patients, HIV infection in patients involved in this study was confirmed by ELISA. Samples were centrifuged and smears were prepared and stained with Papanicolaou stain. **Result:** 59 patients 37 (62.7%) were males, and 22 (37.3%) were females. The age of patients ranged between 20 - 60 years. Out of the 59 cases, 46 (77.9%) smears reported as negative, 8 (13.6%) as Bacterial infections, 3 (5.1%) as

Trichomonas, and 2 (3.4%) smears showed BK polyoma virus changes (Decoy cells). The study revealed that duration of the HIV infection was correlated to cytology findings; however on 45 of patients (account to 76%) the duration of the disease was from 1 week to 240 weeks. **Conclusion:** Urine cytology is a simple, rapid, and cost-effective method, which can be used in low resource settings, such as in Sudan. Urine cytology is a useful follow up tool for detection of infections in HIV patients, specifically viral infections.

KEYWORD: urine, cytology, HIV.

INTRODUCTION

Cytology is the study of cells that are exfoliated from epithelial surfaces, or shed from mucus membranes. Cells are stained with a number of tinctorial or other stains that enable the nuclear and cytoplasmic features of cells to be examined. The cells usually originate from epithelial, or epithelial like tissues, and are most simply obtained as the epithelium exfoliates. These cells may be naturally exfoliated as in sputa or urine, or the cells may be mechanically obtained by brushing or scraping. Sometimes cells may be obtained by the use of fine needle aspiration.^[1]

Urine cytology is generally not a screening test for the general population. It has been found useful for surveillance of symptomatic patients and selected populations at increased risk for the development of urothelial carcinoma as a result of smoking or industrial chemical exposure.^[2]

HIV/AIDS is a major health problem in many parts of the world, and is considered a pandemic (a disease outbreak which is present over a large area and is actively spreading. Approximately 34 million people have HIV globally. Of these, approximately 16.8 million are women and 3.4 million are less than 15 years old. HIV/AIDS resulted in about 1.8 million deaths in 2010, down from 3.1 million in 2001.^[3]

The objective of this study to determine the cytological changes in urine samples from HIV infected patients, and to correlate cytological findings with type of infection and duration of disease.

MATERIALS AND METHOD

Study design

Prospective study conducted at bashair hospital to screen urine samples of HIV positive patient.

Study Area

The study was being conducted at Khartoum state, urine samples were collected at bashair hospital.

Study population

Volunteer adult males and females above 18 years, and positive for HIV were included in this study.

Sample size

Fifty nine samples have been included in this study. Out of the 59 patients 37 (62.7%) were males, and 22 (37.3%) were females.

Lab diagnosis

Structured questionnaires were filled following individual with each patient and the collected data analyzed. Full voided urine samples were collected in wide mouth container, 5 ml from each sample was centrifuged for five minutes at 1200 rpm, the supernatant was decayed and the deposits were smeared in clean labeled microscopic slides. The slides were stained with Papanicolaou stain.

The slides was Immersed in the fixative (95% Ethanol) for 15 minutes, Hydrated in 70% alcohol for two minutes, rinsed in water for one minutes, the nucleus were stained in Harris's Haematoxylin for five minutes , rinsed in water for two minutes, rinsed in water for two minutes, Blued in Scott's tap water two minutes, rinsed in water for two minutes, dehydrated for two minutes as fellows 70% alcohol, two changes of 95 % Alcohol, the cytoplasm was stained in O.G.6 for two minutes, dehydrated for two minted in 70% alcohol, two changes of 95 % Alcohol, stained in E.A 50 for three minutes, rinsed in 95 % alcohol for one minutes, cleared in Xylene and mounted in D.P.X.

Evaluations of smears

The slides were examined under Olympus microscope X10 for screening and X40 to describe the changes of the cells and report was written, Smears were examined by a Cytologist and reexamined by a pathologist to verify findings and the data was analyzed to measure the central tendency and ratio by using computer software program Statistical Package for Social Science (SPSS) ver.16 and presented in graphs, tables and text.

Ethical clearance

All patients enrolled in this study were informed About the aim f the study and the content was obtained from each. The works was approved by the ethical committee at the University Medical Science and technology and also approved by faculty committee.

RESULT

Cytological changes were assessed among 59 AIDS positive patient, the mean age was 40 years. Among these 37(63%) were males and 22(37%) were females as figure (1). Cytological changes among the study group as follow were 46(77.9%) were negative, 8(13.56%) showed bacterial infection, 3 (5.08%) showed trichomonas vaginalis and 2 (3.39%) showed BKpolyoma virus infection as table (1).

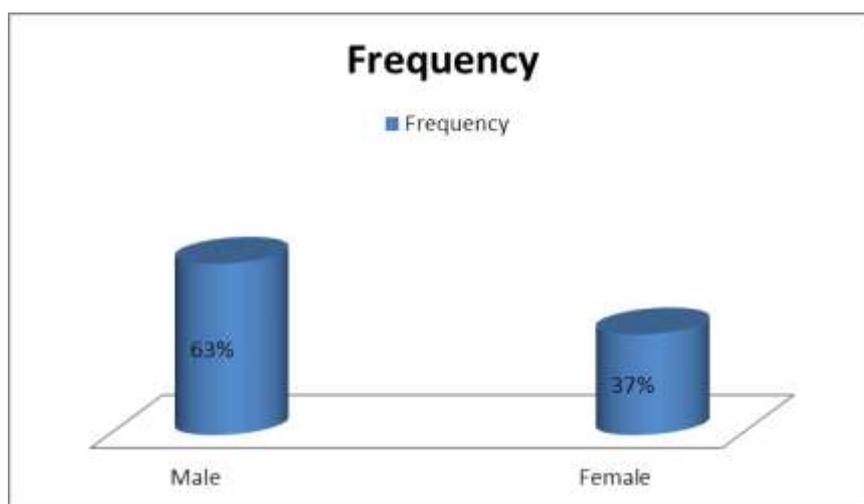


Figure (1): the frequency of study population by gender.

Table (1): Distribution of cytological finding in the study samples

	Negative	Bacterial infection	Trichomonas infection	B.k. virus Decoy cells
Frequency	46	8	3	2
Percentages	77.97%	13.56%	5.08%	3.39%

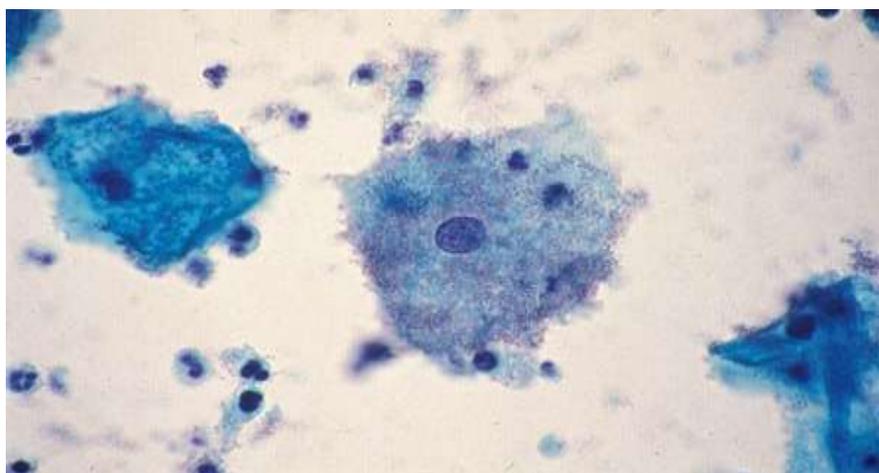


Figure (2) Cytological smear show intermediate epithelial cell with cytoplasm full of coccobacilli (clue cell).



Figure (3): *Trichomonas vaginalis* x40. Cytological smear Show *Trichomonas Vaginalis* with bean shape and no flagellate present due to staining process.

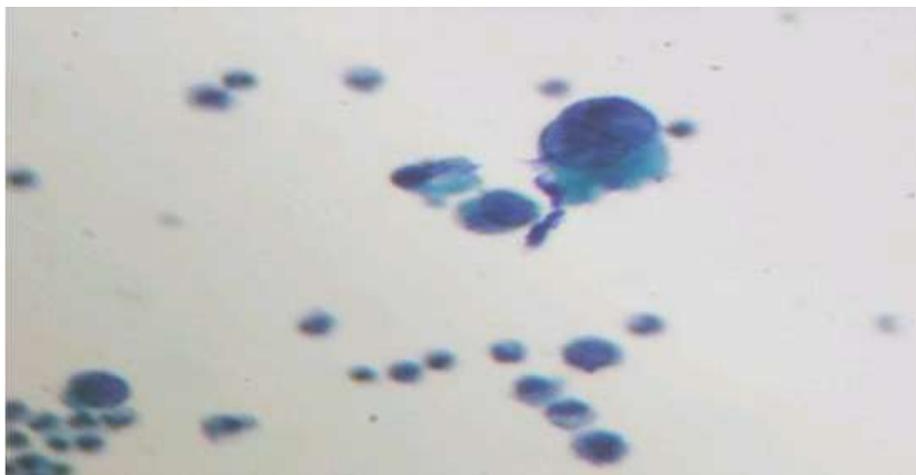


Figure (4): BK Polyoma virus x40. Cytological smear Show decoy cells with nuclear inclusions due to infection by BK polyoma virus.

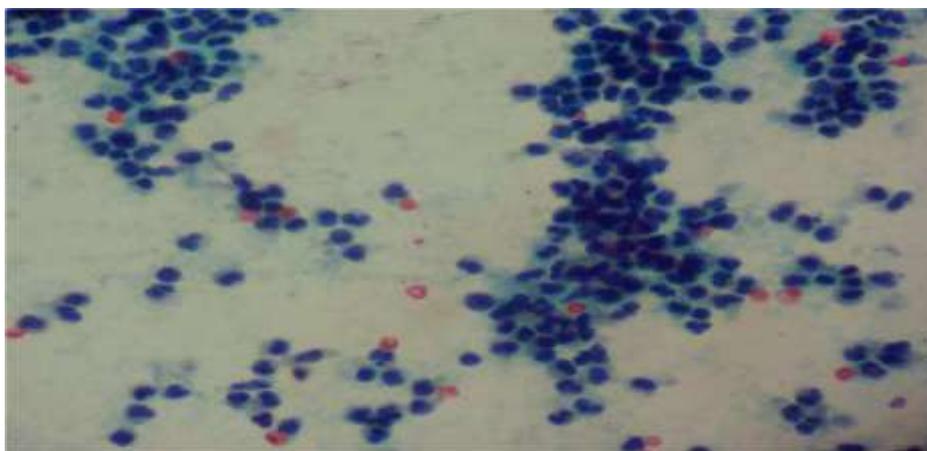


Figure (5): Bacterial infection x40. Cytological smear show polymorphnuclear cells associate with acute inflammation.

DISCUSSION

Human immunodeficiency virus (HIV) and its subtypes are retroviruses, and they are the etiologic agents of AIDS. Human retroviruses were unknown until the 1980's. Since AIDS was first recognized in 1981, it has led to nearly 30 million deaths (as of 2009).^[4] Out of the 59 cases, 46 (77.9%) smears reported as negative, 8 (13.6%) as Bacterial infections, 3 (5.1%) as Trichomonas, and 2 (3.4%) smears showed BK virus changes (Decoy cells). In our study duration of the HIV infection was correlated to cytology findings, however on 45 of patients (account to 76%) the duration of the disease was > 5 years.

The evaluation of Cytopathology specimens in immunocompromised patients is studied on the literature in many publications. Selvaggi, M Suzanne (2010), in united states in the department of Pathology and Laboratory Medicine at University of Wisconsin School of Medicine and Public Health in Madison, Wisconsin. Study to report on infectious agents detected in urine specimen of renal transplant patients concluded that urine cytology plays a role not only in the detection of BK virus but also other infectious agents which have an impact on the follow-up and patient management.^[5]

In our study, (3.4%) of cases were diagnosed to have BK Polyoma virus cytological changes (Decoy cells). Human polyoma viruses are the members of the papova virus family which have a double strand DNA-genome.^[6] Recently, BK virus recognized as a cause of severe renal allograft dysfunction and potential graft loss.^[7]

Decoy cell was first recognized in the 1950s, by the late Mr. Andrew Ricci, senior cytotechnologist at Memorial Hospital for Cancer in New York, then Koss and colleagues coined the term "decoy cells" to alert cytologists not to misdiagnose viral inclusion bearing cells as malignant cancer cells.^[8] Decoy cells are Urothelial cells have large, eccentrically placed nucleus with basophilic nuclear inclusions. Selvaggi SM reported positive Pyloma (BK) viral inclusions in 19.7% of urine samples from renal transplant patients,^[9] however the high percentage in the later study may explained by the large sample size (n= 7116). Another study conducted by Semple K, observed Decoy cells in 10% of urine samples.^[10]

CONCLUSION

Urinary cytology is a simple, rapid, and cost-effective method, which can be used in low resource settings, such as in Sudan. Urine cytology plays a role in the detection of infectious

agents which have an impact on the follow-up and patient management. The bacterial, fungal and viral infections are most common among the patient during the first 5 years.

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