

## **Letter from the Dean**

Sudan is one of the least documented countries in issuing medical magazines/journals, particularly in the Medical Laboratory Science. The results of this awareness and the demand for such means have prompted and inspired me to expedite the preparation and issuing of this first issue with the help of Miss. Arwa Elaagip, Lecturer of Medical Entomology.

Since the 70s, we have witnessed and demanded an exponential rise in the number of medical laboratory scientists; the fuel of the development and improvement of this profession.

Today we are surrounded by an enormous amount of information, yet we are still ignorant of many diseases and techniques.

The objective of issuing this journal is initiated from this awareness and intended to be the remedy for this ignorance and be the voice and face of the medical laboratory scientists in general and our faculty (the pride of the faculties) in particular.

I hope it will achieve that aim and the dream comes true. Moreover, I will be grateful for comments and suggestions from which the inspiration for future improvement will come. Your contribution will be the guarantee and mainstay for its unending continuity and persistence.

Thanks

**Prof. Dr. Naser Eldin Bilal**

**Dean Faculty of Medical Laboratory Sciences**

**Increased multi-drug resistant *Escherichia coli* from hospitals in  
Khartoum state, Sudan**

**Mutasim Ibrahim, Naser Bilal, Mohamed Hamid**

**African Health Sciences. 2012; 12(3): 368- 375**

**Abstract**

**Background:** Multidrug-resistant *Escherichia coli* (MDR *E. coli*) has become a major public health concern in Sudan and many countries, causing failure in treatment with consequent huge health burden.

**Objectives:** To determine the prevalence and susceptibility of MDR *E. coli* isolated from patients in hospitals at Khartoum State.

**Methods:** Between May to August 2011, *E. coli* (n = 232) isolated from clinical specimens, identified, tested their antimicrobials susceptibility and screened for extend spectrum  $\beta$ -lactamase production as per standard methods.

**Results:** Of the 232 *E. coli* isolates, the majority were from urine (65.1%). MDR *E. coli* were present in 214 (92.2%). Of these, the resistance rates were recorded to: amoxicillin 97.7%, cefuroxime 92.5%, trimethoprim-sulfamethoxazole 88.3%, tetracycline 77.1%, nalidixic acid 72%, ceftriaxone 64%, ciprofloxacin 58.4%, ofloxacin 55.1%, amoxicillin-clavulanate 50.4%, ceftazidime, gentamicin 35% each, nitrofurantoin 22.4%, chloramphenicol, tobramycin 18.2% each and amikacin 1.9%. Overall MDR *E. coli*, 53.3% were resistant to > 7 antimicrobial agents and ESBL was detected in 32.7%. Isolates from males were more resistant than those from females ( $p < 0.05$ ).

**Conclusions:** Drug-resistance surveillance and epidemiological analysis of patient data is need periodically and can be informative for appropriate management of antimicrobial resistance.

**Distribution of Class I integrons and their effect on the prevalence of multi-drug resistant *Escherichia coli* clinical isolates from Sudan**

**Mutasim Ibrahim, Magzoub Magzoub, Naser Bilal, Mohamed Hamid**

**Saudi Medical Journal. 2013; 34(3): 240-247**

**Abstract**

**Objectives:** To analyze integrons gene cassettes Class I among *Escherichia coli* (*E. coli*) isolates from Sudan and to determine their effect on the prevalence of resistance to antimicrobials.

**Methods:** This cross-sectional study was conducted at 6 hospitals in Khartoum State, Sudan between April and August 2011. *Escherichia coli* (n=133) isolated from clinical specimens of patients were included. Isolates were identified and tested for antimicrobial susceptibility following standard procedures. Multidrug resistance (MDR) patterns was defined as nonsusceptibility to  $\geq 3$  antimicrobials. Class I integrons was detected by polymerase chain reaction, and gene cassettes were characterized via sequencing analysis.

**Results:** Of the 133 *E. coli* isolates, 40.6% (n=54) harbored Class I integrons. All the 54 integron carriage, *E. coli* was found to be MDR strains. Integron carriage isolates confer higher levels of resistance than any other isolates ( $p<0.05$ ) such as amoxicillin-clavulanic acid (66.7% versus 36.7%), ceftazidime (46.3% versus 17.7%), chloramphenicol (29.6% versus 7.6%), ciprofloxacin (70.4% versus 43%), tetracycline (88.9% versus 57%) and trimethoprim-sulfamethoxazole (98.1% versus 69.6%). Sequencing of gene cassettes harbored mostly dihydrofolate reductase (dfrA), which encodes resistance to trimethoprim and aminoglycoside adenyltransferase (aadA) that encodes resistance to streptomycin. The most frequent combination types were dfrA17 and aadA5 genes.

**Conclusions:** Class I integrons were quite common and its carriage contributed significantly to the emergence of MDR among *E. coli*. Nevertheless, factors leading to the wide spread of integrons are still to be determined.

**Inducible clindamycin resistance and nasal carriage rates of *Staphylococcus aureus* among healthcare workers and community members**

**Alaa Mahmoud, Hanaa Albadawy, Samira Bolis, Naser Bilal, Abdalla Ahmed, Mutasim Ibrahim**  
**African Health Sciences**

**Abstract**

**Background:** Nasal carriage of *Staphylococcus aureus* is becoming an increasing problem among healthcare workers and community individuals.

**Objectives:** To determine the prevalence of methicillin-resistant *S. aureus* (MRSA) nasal colonization and inducible clindamycin resistance (ICR) of *S. aureus* among healthcare workers at Soba University Hospital and community members in Khartoum State, Sudan.

**Methods:** Nasal swabs (n=500) were collected during March 2009 to April 2010. Isolates were identified using conventional laboratory assays and MRSA were determined using disk diffusion method. D-test was performed for detection of ICR isolates as per Clinical Laboratory Standard Institute guidelines.

**Results:** Of the 114 *S. aureus* isolated, 20.2% represented MRSA. The occurrence of MRSA were significantly higher among healthcare worker than community individuals [32.7% (18/55) vs. 6.9% (5/59)] (p=0.001). Overall the 114 *S. aureus* isolates tested for ICR by D-test, 29 (25.4%) were yielded inducible resistance. Significantly higher (p=0.026) ICR was detected among MRSA (43.5%) than methicillin-susceptible *S. aureus* (MSSA) (20.9%).

**Conclusion:** Elevating of MRSA nasal carriage among healthcare workers need infection control practice to prevent transmission of MRSA in hospitals. The occurrence of ICR in *S. aureus* is of a great concern, D- test should be carried out routinely in our hospitals to avoid therapeutic failure.

**Prevalence of extended-spectrum  $\beta$ -lactamases-producing *Escherichia coli* from hospitals in Khartoum State, Sudan**

**Mutasim Ibrahim, Naser Bilal, Magzoub Magzoub, Mohamed Hamid**

**Oman Medical Journal. 2013; 28(2): 119-123**

**Abstract**

**Objective:** This study aimed to determine the prevalence and assess antimicrobial susceptibility of extended-spectrum  $\beta$ -lactamase-producing *Escherichia coli* isolated from clinical specimens of patients at hospitals in Khartoum State, Sudan.

**Methods:** During April to August 2011, a total of 232 *E. coli* isolates were collected from various clinical specimens of patients. Isolates were identified, tested for antimicrobial susceptibility and screened for ESBL production as per standard methods. The double-disk diffusion method was used to confirm ESBL production using antimicrobial disks of ceftazidime (30  $\mu$ g), cefotaxime (30  $\mu$ g), with or without clavulanic acid (10  $\mu$ g). A zone difference of 35 mm between disks was considered indicative of ESBL production.

**Results:** Out of 232 *E. coli* isolates, 70 (30.2%) were found to be positive for ESBL by the applied phenotypic methods. ESBL producing isolates yielded high resistance rates for trimethoprim-sulfamethoxazole (98.6%), tetracycline (88.6%), nalidixic acid (81.4%) and ciprofloxacin (81.4%). The highest antimicrobial activities of ESBL-producing isolates were observed for amikacin (95.7%), followed by tobramycin (74.3%) and nitrofurantoin (68.6%). Resistance to quinolones, aminoglycosides, trimethoprim-sulfamethoxazole, tetracycline, nitrofurantoin and chloramphenicol was higher in ESBL than non-ESBL isolates ( $p<0.05$ ). The frequency of ESBL-producing isolates varied among hospitals (18.2% to 45.1%), although a high prevalence was recorded as 45.1% in Khartoum Teaching Hospital. Wound specimens were the most common source of ESBL-producing isolates. The proportion of ESBL-producing *E. coli* did not differ significantly between adults and children (31% vs. 27%).

**Conclusion:** The prevalence of ESBL-producing *E. coli* detected in this study is of great concern, which requires sound infection control measures including antimicrobial management and detection of ESBL-producing isolates.

**Comparative study of antimicrobial resistance patterns of pathogenic *Escherichia coli*  
collected from hospitals in Sudan and Saudi Arabia**

**Mutasim Ibrahim, Naser Bilal, Mohamed Hamid**

**Abstract**

**Background:** Antimicrobial resistance among pathogenic *Escherichia coli* is an increasing problem especially in developing countries.

**Aims:** To compare between resistance patterns of *E. coli* isolated in Sudan to those from Saudi Arabia.

**Methods:** A descriptive comparative study conducted between May 2010 and August 2011. *E. coli* (n= 402) collected from hospitals in Khartoum State, Sudan and in Aseer region, Saudi Arabia were studied. Identification and antimicrobial susceptibility testing of isolates were performed following standard methods. Multi-drug resistance (MDR) was defined as non-susceptibility to  $\geq$  three antimicrobials.

**Results:** Of the 402 *E. coli* isolates studied, MDR patterns were significantly higher among isolates from Sudan than Saudi Arabia [92.2% (214/232) vs. 70.6% (120/170)] (p = 0.000). The resistance rates of *E. coli* isolates were recorded as follows (Sudan and Saudi Arabia): High to moderate resistance to amoxicillin (97.7% and 94.2%), trimethoprim-sulfamethoxazole (88.3% and 82.5%), tetracycline (77.1% and 74.2%), amoxicillin-clavulanic acid (51.4% and 70%), ceftriaxone (64% and 52.4%) and ciprofloxacin (58.4% and 40%). Low resistance was to ceftazidime (35% and 20%), gentamicin (35% and 17.5%) and nitrofurantoin (22.4% and 11.7%). Resistance to amikacin was uncommon (1.9% and 5%). Significant differences (p < 0.05) in resistance rates of isolates between both countries in term to patient's gender and age. The most frequent MDR profiles among isolates were to  $\beta$ (15.9%) and to  $\beta$ (20.8%) of tested antimicrobials in Sudan and Saudi Arabia, respectively.

**Conclusions:** Variation and emerging of antimicrobial resistance among pathogenic *E. coli* isolates was observed in both countries. Continuous monitoring of resistance profiles, locally and international surveillance programs are required.

**Development and Evaluation of Loop-Mediated Isothermal Amplification Assay for  
Detection of Crimean Congo Hemorrhagic Fever Virus**

**Hana Osman, Kamal Eltom, Nasreldin Bilal,**

**Stuart Nichol, Mustafa Elbashir, Imaadeldin Aradaib**

**Journal of Virological Methods. 2013; 190:4-10**

**Abstract**

Crimean-Congo hemorrhagic fever (CCHF) virus (CCHFV) activity has been detected in Kordufan region of the Sudan in 2008. Since then, several sporadic cases and nosocomial outbreaks associated with high case-fatality rates have been reported in villages and rural hospitals in the region. Therefore, in the present study, a reverse transcription (RT) loop-mediated isothermal amplification (RT-LAMP) assay was developed and compared to nested RT- PCR for rapid detection of CCHFV targeting the small (S) RNA segment. A set of RT-LAMP primers, designed from a highly conserved region of the S segment of the viral genome, was employed to identify all the Sudanese CCHFV strains. The sensitivity studies indicated that the RT-LAMP detected as little as 0.1 fg of CCHFV RNA (equivalent to 50 viral particle). There was 100% agreement between results of the RT-LAMP and the nested PCR when testing 10-fold serial dilution of CCHFV RNA. The specificity studies indicated that there was no cross-reactivity with other related hemorrhagic fever viruses circulating in Sudan including, Rift Valley fever virus (RVFV), Dengue fever virus, and yellow fever virus. The RT-LAMP provides high levels of diagnostic sensitivity and specificity when testing a variety of acute-phase sera sampled during disease outbreaks in Kordufan region of the Sudan during 2008-2011. The RT-LAMP was performed under isothermal conditions at 63 °C and no special apparatus was needed, which rendered the assay more economical and practical than real-time PCR in such developing countries, like Sudan. In addition, the RT-LAMP provides a valuable tool for rapid detection and differentiation of CCHFV during an outbreak of the disease in remote areas and in rural hospitals with resource-poor settings.

**International spread of major clones of methicillin resistant *Staphylococcus aureus*:  
nosocomial endemicity of multi locus sequence type 239 in Saudi Arabia and Romania**

**M Cîrlan, M Saad, G Coman, Naser Bilal, AM Elbashier, D Kreft, S Snijders, W van  
Leeuwen, A van Belkum**

**Infect Genet Evol. 2005; 5(4):335-339**

**Abstract**

Phenotypically identified methicillin resistant *Staphylococcus aureus* (MRSA) strains from several hospitals in Romania and Saudi Arabia ( $n = 103$  and 68, respectively) were confirmed to be MRSA by *mecA* PCR and PBP-2' based latex agglutination. Subsequently, strains were differentiated at the sub-species level using pulsed field gel electrophoresis (PFGE) of *Sma*I DNA macro-restriction fragments. Comparison of the PFGE fingerprints identified major clusters of strains, persistently present in the various hospitals. Endemicity of certain strains was identified, amongst others one due to a particularly methicillin resistant type in the burn wound sector of the Romanian hospital. No PFGE-based overlap was found between the Saudi and Romanian strains. However, multi locus sequence typing (MLST), performed for 20% of all strains, revealed that genuine genetic similarity was obscured by the PFGE analysis. In both the Romanian and Saudi hospitals the renowned sequence type (ST) 239 was very over-represented. This was especially apparent in Saudi Arabia, where all strains except two shared the ST 239 genotype. This clonal type has previously been identified in a variety of other countries. Despite the MLST concordance, PFGE data indicate that ST 239 diversifies while maintaining its core genome intact. ST 80, another previously but less frequently identified clone, was introduced in 2000 in the Romanian institutes and persisted over the past 3 years as a frequent cause of infections in a surgical department. The successful MRSA types can acquire prominent positions in hospitals of previously low-endemicity MRSA status.

**Endemic nosocomial infections and misuse of antibiotics in a maternity hospital in Saudi Arabia**

**N Bilal, M Gedebou , S Al-Ghamdi**

**APMIS. 2002; 110(2): 140-147**

**Abstract**

Patients admitted during a 6-month period to a maternity hospital in Saudi Arabia were studied for nosocomial infections and misuse of antibiotics. Patient history and diagnosis on admission and subsequent clinical and laboratory data were analysed. Infection developing from 72 h after admission was considered nosocomial. Therapeutic and prophylactic data as recorded on the patients' charts were assessed for possible misuse of antibiotics. Of 3439 patients, 136 (4.0%) developed nosocomial infection: 2.0%, 8.9% and 37.7% in obstetric, gynaecologic and nursery patients, respectively. Infections among adults were mostly found in the urinary (44.4%) and lower genital (33.3%) tracts. Among newborns, over 70% of cases were eye and ear (29.8%), skin (26.2%) and blood (19.0%) infections. Gram-negative bacteria caused 65.7% of the infections. Over 90% of the bacterial isolates were multidrug-resistant. About 24% of patients received single or multiple antibiotics; 57.2% were misused. The minimal hospital cost estimate for both nosocomial infections and misused antibiotics was US \$318,705. The findings of this study, the first of its type in this region, should prompt improved infection control measures as well as educational and antibiotic restriction interventions.

# **Rotavirus infection among Sudanese children younger than 5 years of age: a cross sectional hospital-based study**

**Magzoub Magzoub, Naser Bilal, Jalal Bilal, Omran Osman**

**PanAfrican Medical Journal. 2013; 16(88)**

## **Abstract**

**Background:** In Sudan, rotavirus has been one of the important causative agents of diarrhea among children. Rotavirus A is well known as the leading cause of diarrhea in young children worldwide. It was estimated to account for 41% of hospitalized cases of acute gastroenteritis among children in Sub-Saharan Africa. This study aimed to determine the prevalence and the common clinical presentations of rotavirus A infection among Sudanese children with gastroenteritis seeking management in hospitals.

**Methods:** 755 Sudanese children less than 5 years of age suffering from acute gastroenteritis in hospital settings were included. The positive stool specimens for rotavirus A was used for extract Ribonucleic acid (RNA) and the RNA product was loaded on formaldehyde agarose gel and visualized under UV illumination.

**Results:** Of the 755 children, 430(57%) were males while 325(43%) were female. The age of children ranged from 1 to 60 months. There were 631 (84%) children who were less than 24 months of age. Out of the 755 stool samples, 121(16%) were positive for rotavirus. Of the 121 infected children with rotavirus, 79(65.3%) were male and 42(34.7%) were female and the highest infection rate was seen among 91(75.2%) of children up to 12 months of age. Children of illiterate parents were more infected with rotavirus than children of educated parents. Severe dehydration present among 70% of infected children with rotavirus.

**Conclusion:** Since this study is hospital-based, the 16% prevalence rate may not reflect the true prevalence among Sudanese children, thus a community-based surveillance is needed.

**Vaginal infections among pregnant women at Omdurman Maternity Hospital, Khartoum state, Sudan**

**Zeinab Abdel Aziz, Naser Bilal, Mutasim Ibrahim, Mohamed Hamid**

**Abstract**

**Background:** Microbial infections of the vagina among pregnant women are health problem lead to serious medical complications and consequences burden. This study aimed to investigate and determine antimicrobial susceptibilities of the causative agents of vaginal infections among pregnant women.

**Methodology:** A cross sectional study conducted among pregnant women ( $n = 200$ ) between August to December 2008 at the Omdurman Maternity Hospital, Khartoum State, Sudan. Vaginal and cervical swabs were obtained from each subject and processed for isolation and identification of pathogenic microorganisms using standard methods of wet mount preparation, direct gram smear, Nugent scoring system, direct immunofluorescence and cultural techniques. Antimicrobial susceptibility testing of bacterial isolates was performed as per standard procedures. Statistical analysis was done using SPSS program version 12.0. A  $p$  value  $< 0.05$  was statistically significant.

**Results:** Among the 200 pregnant women enrolled, bacterial vaginosis (BV) was the most prevalent (49.8%), followed by *Chlamydia trachomatis* (31.3%) and *Candida albicans* (16.6%) with lower frequency of *Neisseria gonorrhoeae* (1.8%) and *Trichomonas vaginalis* (0.5%). Higher infection rates were recorded among subjects those in the third trimester (71.6%) than the second trimester gestation (28.4%). No significant association ( $p = 0.7$ ) between history of abortions and *C. trachomatis* infections. Gentamicin was the most active agent against Gram-positive and Gram-negative bacteria. Clarythromycin was the most active against *Mycoplasma* species.

**Conclusions:** Pregnant women with vaginal complaints revealed various positive microbiology results. Such cases may need to seek specific medication. Routine culture of

vaginal and cervical sample is advised to be performed on all pregnant women during prenatal visit.

# **A Comparison Study of Histochemical Staining of Various Tissues after Carnoy's Versus after Formalin Fixation**

**Hussain Gadelkarim Ahmed, Ahmed Ibn Idris Mohammed**

**Journal of Cancer Science and Therapy. 2011; 3: 084-087**

## **Abstract**

**Background:** The potential problems related to the use of formalin in histopathology, such as health hazards, deterioration of nucleic acids are well-known. The aim of this study was to evaluate the utilization of a Carnoy's solution fixation in comparison with formalin on subsequent tissue sectioning and histochemical staining.

**Materials and Methods:** Corresponding sections of 25 tissue biopsies of rabbit's different organs were fixed in Carnoy's solution and in 10% neutral buffered formalin. Samples were processed using the conventional method and then stained applying five histochemical methods. The degree of the quality of the staining was assessed for each method by scoring system (1-10) depending on comparison of the stained tissue sections with illustrated photomicrographs.

**Results:** For the quality of cutting, the best quality was obtained by Formalin (mean = 4.76) then Carnoy's fixative (mean = 3.84). The best quality of Haematoxylin and Eosin staining was obtained by formalin (mean = 5.28) then Carnoy's (mean = 4.00). For Alcian blue and Perl's Prussian blue, the best staining qualities were obtained by Formalin (mean = 4.76 and 5.64 respectively) followed by Carnoy's (mean = 2.88 and 3.92 respectively). For periodic Acid Schiff's the best staining quality was obtained following Carnoy's fixation (mean = 4.52) then, the formalin (mean = 3.76).

**Conclusion:** Although, Carnoy's fluid is a save fixative and can rapidly penetrate the tissues, but it can't be a substitute for formalin.

## Characterization of lipid profiles in coronary heart disease

### Patients in Sudan

**Hassan H Musa, Etyayeb M Tyrab, Muzamil M Abdel Hamid, Elbagire A Elbashir, Lemya M**

**Yahia, Nihad M Salih**

**Indian Heart Journal. 2013; 1-2**

Although the burden of cardiovascular disease (CVD) states is stabilizing in high-income countries, in low-to-middle income countries it continues to rise.<sup>1</sup> Lifestyle, environmental and genetic factors play an important role in coronary heart disease (CHD) development.<sup>2</sup> Previous studies have shown that blacks have one of the highest rates of coronary artery disease in the world.<sup>3</sup> However, Caucasians generally have higher mean total cholesterol (TC) concentrations than do populations of Asian or African origin.<sup>4</sup> Hospital based case control study was design to study lipid profile in coronary heart disease patients in Sudan. Among the total population studied (104 cases and 105 controls) 53.1% were male, 45% were from northern Sudan and 72.7% were residing in urban areas. About 26.8% of the most infected age group was less than 40 years, 22% had strong family history of CHD, 42.6% had hypertension and 41.6% had diabetes mellitus. Smoking and alcohol consumption are very low among population represent 18.2% and 5.3%, respectively. Lipid profiles were analyzed using standard enzymatic methods on a MINDRAY BS-200 analyzer (MINDRAY, Shenzhen, China). General linear model and correlation between serum biochemical profiles were performed using SPSS15.0. The results showed that Sudanese patients had significantly lower TC and LDL-C levels and non-significantly lower triglycerides, HDL-C and VLDL levels compared with controls (Table 1). Age has a significant ( $p < 0.05$ ) effect on LDL-C, while sex, race or ethnic, family history, residence, smoking, alcohol consumption has no significant ( $p < 0.05$ ) effect on lipid profiles. Hypertension has no significant ( $p < 0.05$ ) effect on lipid profiles, while diabetes mellitus has a significant ( $p < 0.05$ ) effect on total cholesterol, and LDL-cholesterol (data not shown). Among patients total cholesterol was significantly ( $p <$

0.05) and positively correlated with LDL and HDL, while VLDL was positively correlated with triglycerides. In contrast, triglycerides and VLDL were negatively correlated with LDL and HDL similarly VLDL was positively correlated with triglycerides (Table 2). In control group total cholesterol was significantly ( $p < 0.05$ ) and positively correlated with triglycerides, LDL and VLDL. Triglyceride was negatively correlated with HDL and positively with VLDL and HDL was negatively correlated with LDL and VLDL (Table 2). Blacks had nominally higher adjusted HDL-C levels, and significantly lower triglyceride levels than whites.<sup>5</sup> African ancestry was significantly associated with decreased total cholesterol, LDL-cholesterol and triglycerides.<sup>6</sup> These observed associations between African ancestry and several lipid traits are consistent with the general tendency of individuals of African descent to have healthier lipid profiles compared to European Americans.<sup>6</sup> Our results confirm a high prevalence of conventional risk factors of coronary heart disease as well as the association between these factors with lipid profiles in Sudanese population. However, sample size used was very small of the general population, other studies using large sample size were needed to provide more accuracy and predictive value of coronary heart disease risk factors.

## Role of Some Risk Factors in the Etiology of Breast Cancer in the Sudan

Hussain G Ahmed, Rehab M Musa, Mohmmmed M Eltybe, Mohmmmed OM Hussein

The Open Breast Cancer Journal. 2010; 2: 71-78

### Abstract:

**Aim:** The aim of this study was to correlate breast cancer by common breast cancer risk factors in the Sudan.

**Methodology:** Using a purposeful questionnaire 150 female breast cancer patients and 100 apparently health controls were asked detailed information on about risk factors.

**Results:** Out of the 150 women with breast cancer, 38 (25.3%), 22(14.7%), 26(17.3%), 20(13.3%), 21(14%), 11(7.3%), 72(48%), and 86(57.3%) were identified as having a previous history of oral contraceptives usage, a family history of breast cancer, a past history of benign breast disease, a previous history of breast cancer, a previous breast biopsy, claimed other cancers in their families, confessed a pesticides exposure, and over weigh in most of their lives respectively. Out of the 150 women, 44(29.3%) were found to have a previous physical activity. Moreover, 44.8% and 66.9% have attended the menarge at the age of 13 and 14 respectively. Of these factors, statistical significant risks were found with, past history of benign breast disease ( $P < 0.04$ ), previous breast biopsies ( $P < 0.07$ ), pesticides and plasticizers exposure ( $P < 0.01$  and  $0.04$ ), period of being overweight ( $P < 0.001$ ), practice physical activities ( $P < 0.0001$ ), unmarried ( $P < 0.002$ ), decreased number of children ( $P < 0.002$ ). According to the ethnic group, Gaalyaeen tribes represented 61(40.7%) of the study subjects. Most of the patients were from Khartoum state, constituting 37.3%.

**Conclusion:** There was variable exposure to many risk factors for breast cancer in the Sudan. The study suggests further separate measurement of risk factors for breast cancer, as well as, factors that might reduce those risk factors. Cohort mean of evaluation is highly recommended.

## Accuracy of oral exfoliative cytology in Sudanese patients undergoing oral biopsy

Ali Mahmoud M Edris, Hussain G Ahmed, Elneel A Mohammed

RSBO. 2011; 8(3): 255-260

### Abstract

**Introduction:** Early detection of a premalignant or malignant oral lesions promises to improve the survival and the morbidity of patients suffering from these conditions. Oral exfoliative cytology (OEC) is a non-invasive method that is well accepted by the patient, and is therefore, suitable for screening at-risk population for early diagnosis of oral cancer.

**Objective:** The purpose of this study is to investigate the value of OEC in the detection of oral premalignant and malignant lesions.

**Material and methods:** In this hospital-based case-control study, cytological scrapes from buccal mucosa were obtained from 100 individuals, of whom 50 were patients with oral lesions ascertained as “cases” and 50 were clinically healthy volunteers ascertained as “controls”. All patients with oral lesions were also subjected to oral biopsy and histological examination.

**Results:** Out of 50 cases studied, histopathology showed the presence of: Oral squamous cell carcinoma OSCC ( $n = 28$ ), leukoplakia ( $n = 8$ ), dysplasia ( $n = 3$ ), and benign normal lesions ( $n = 11$ ). In cytology, a specificity of 100%, sensitivity of 93% and accuracy of 92% were obtained for OSCC. Leukoplakia gave a specificity of 100%, a sensitivity of 87.5%, and an accuracy of 95%.

**Conclusion:** Despite the small number of cases in this study, OEC is a useful method for detecting oral premalignant and malignant lesions. OEC can detect a number of pathological conditions that require management.

# Screening for Tuberculosis and Its Histological Pattern in Patients with Enlarged Lymph Node

Hussain G Ahmed, Akram S Nassar, Ibrahim Ginawi

Patholog Res Int. 2011; 2011: 417635.

## Abstract

### Setting

Tuberculosis is a major health problem in the Republic of Yemen. Tuberculous lymphadenitis is one of the most common forms of extrapulmonary tuberculosis. Therefore, this retrospective descriptive study was conducted in Yemen to investigate the morphological pattern of tuberculous lymphadenitis, as well as to assess the reliability measures of (ZN) Ziehl-Neelsen and fluorescent methods in identification of *Mycobacterium tuberculosis*.

### Methodology:

One hundred lymph nodes tissue biopsies that were previously diagnosed by conventional histopathology as having tuberculous lymphadenitis were reinvestigated. Five micron in thickness sections were obtained from formalin-fixed paraffin wax processed tissues. The sections were stained using Haematoxylin and eosin (H & E), ZN, and fluorescent methods.

### Results:

All of the 100 specimens were proved as having histopathological pattern of tuberculosis lymphadenitis. The most major histological features were giant cell (88%), caseation (84%), epithelioid cells (80%), granuloma and caseation (68%), lymphocytes (31%), and histiocytes (4%). After staining the specimens with ZN and fluorescent, of the 100 specimens only 3 (3%) and 9 (9%) specimens were found positive, by ZN and fluorescent methods, respectively.

### Conclusion:

Conventional ZN and fluorescent methods have limitations in diagnosis of tuberculous lymphadenitis due to their lower sensitivity. Histopathology remains the most suitable method for the diagnosis of tuberculous lymphadenitis. In cases of suspected tuberculous lymphadenitis, it is advisable to confirm with more sensitive and specific method, such as

polymerase chain reaction PCR or immunohistochemistry before reporting the negative results.

# **Assessment of Qualitative Changes of Acid Mucins Among Sudanese Colorectal Carcinoma**

## **Patients**

**Yosef M Zakout, Yousra A Ezeldeen**

**Journal of Gastrointestinal Cancer. 2012; 43(2): 205-208**

### **Abstract**

#### **Purpose**

This study aimed to assess the qualitative changes in the amount of acid mucin in colorectal carcinoma (CRC) compared to normal colon.

#### **Methods**

A total number of 100 samples were examined, 50 were colorectal cancer samples (cases) and 50 were normal (controls), all were stained with Alcian blue method.

#### **Results**

Acid mucin increased, in different levels, in 30 (60%) of the cases compared to only six (12%) of controls ( $P < 0.0001$ ). However, complete absence of acid mucin was detected among 10 (20%) of cases compared to none among controls.

#### **Conclusions**

CRC is associated with secretion of increased amounts of acid mucin in most cases, and that should be considered as a valuable histological finding.

**Plants associated with aquatic stages of Onchocerciasis vector *Simulium damnosum sensu lato* in AbuHamed and Galabat Foci in Sudan**

**Isam Zarroug, Arwa Elaagip, Hanan Mohamed, Wigdan Mubarak, Kamal H.**

**Osman, Tong Chor M. Deran, Nabil Aziz, A. D. Nugud**

**Journal of Public Health and Epidemiology. 2013; 5(2): 83-86**

**Abstract**

Onchocerciasis vector, *Simulium (Edwardsellum) damnosum sensu lato* (Diptera: Simuliidae), breeds near rapids and cataracts in running water rich in oxygen and are usually found attached to water plants, trailing roots and branches, stones and rocks. This study was conducted to identify the plant species associated with the aquatic stages of *S. damnosum s. l.* vectors in two foci: AbuHamed in northern Sudan and Galabat in eastern Sudan during 2007 to 2009. All collected aquatic stages were identified as *S. damnosum s. l.* The plants collected are identified as follows: *Digitaria ciliaris* (Retz.) Koel. Family: Poaceae, *Polygonum glabrum* Willd. Family: Polygonaceae and *Phragmites australis* (Cav.) Family: Poaceae in AbuHamed focus, and *Cynodon dactylon* (L.) Pers Family: Poaceae, *Kanahia laniflora* (Forssk.) R.Br. Family: Asclepiadaceae and *Digitaria ciliaris* (Retz.) Koel. Family: Poaceae in Galabat focus. This is the first documentation and identification of plants associated with breeding of *S. damnosum s. l.* in Sudan.

**Haematological findings in Kala-azar, HIV, and Kala-azar/HIV co-infected patients including  
T. lymphocytes differential count by both flowcytometry and double  
immunocytochemistry**

**Awad Elkareem Abbas Mahmoud**

**2008**

**Abstract**

A descriptive study was conducted in two kalazar centers in Tabarak-Allah (Gedarif state) and El- Azaza (Singa state), Eastern Sudan. 160 VL patients out of 520 suspected VL cases were included. Diagnoses were made by direct microscopy using lymph node and/or B.M aspirates and confirmed serologicaly using DAT and/or Katex. There were 96(60%) males, 64(40%) females; mean of patient's ages was 14 years. Full blood count was done for all VL patients. Anemia was found in all, (mean of Hb: 8.5 g/dl), 80(50%) o them had a normocytic normochromic anemia, 16(10%) with microcytic hypochromic, 57(35.4%) with dimorphic anemia, and sickle cells anemia was found in 7 (4.6%) patients. 152 (95%) patients had a platelet count of  $< 140 \times 10^3 / \mu\text{l}$ , 128(80%) patients with TWBCs  $< 3 \times 10^3 / \mu\text{l}$ . The differential WBCs count was a follows: lymphocytes were  $> 40\%$  in 112(70%) patients, neutrophils were  $< 45\%$  in 89(55%) patients, and ESR was  $> 45 \text{ mm/h}$  in 50/50 patients (100%). WBCs morphology was normal in 110(69%) patients, shift to left was found in 40(25%) patients, and shift to right was found in 6(10%) patients. Prominent Target cells were found in 54(34%) patients and nucleated RBCs in 24(15%) patients. The differential T cells count was done for 5 patients. CD4 T cells were  $< 250 / \mu\text{l}$  in all 5 patients. The mean of CD4 was  $210 / \mu\text{l}$ , the mean of CD8 was  $490 / \mu\text{l}$ , and CD4/CD8 ratio was 1/2.3. All parasitologicaly and serologicaly confirmed VL patients were screened for HIV, 6 (3.5%) patients were co-infected, all of them were males, and mean of patients' ages was 25 years. Full blood counts were done for these patients. All patients were anemic (mean of Hb: 8.0 g/dl), 3(60%) patients with normocytic normochromic, 2(40%) patients with microcytic hypochromic anemia. Platelets were  $< 140 \times 10^3$ , and TWBCs were  $< 3 \times 10^3 / \mu\text{l}$  in all patients. The differential WBCs count was a follows: lymphocytes were  $> 40\%$ , neutrophils were  $< 45\%$ , and ESR  $> 45 \text{ mm/h}$  were found in

all patients. Also differential T cells count were done, CD4 T. cells were  $< 200/\mu\text{l}$  in all patients, mean of CD4 was  $180/\mu\text{l}$ , mean of CD8 was  $340/\mu\text{l}$ , and CD4/CD8 ration was 1/1.9. A cross sectional study was done to determine the hematological parameters and T cell subsets count in 30 known seropositive HIV individual, during ART at VCT Centre (Om durman Teaching Hospital), Khartoum state. Anemia was found in 15(50%) patients (mean of Hb: 11g/dl), 12(80%) patients with normocytic normochromic, 3(20%) patients with microcytic hypochromic anemia. 4(13.3%) patients had platelets  $< 140 \times 10^3$ , 5(16.7%) patients with TWBCs  $< 3 \times 10^3/\mu\text{l}$ , 10(33.3%) patients with TWBCs  $> 6 \times 10^3/\mu\text{l}$ . The differential WBCs count; lymphocytes were  $> 40\%$  in 9(30%) patients, neutrophils were  $< 45\%$  in 7(23.3%) patients, neutrophils were  $> 70\%$  in 3(10%) patients. In differential T cells count, CD4 T. cells were  $< 200/\mu\text{l}$  in 20(66.6%) patients, mean of CD4 was  $255/\mu\text{l}$ , mean of CD8 was  $530/\mu\text{l}$ , and CD4/CD8 ration was 1/2.1. We concluded that normocytic normochromic anemia, leucopenia, thrombocytopenia were the common hematological changes in VL and VL/HIV co-infected patients. Relative lymphocytosis and neutropenia were less common. In HIV seropositive individuals anemia were noted in have of patients. Luecocytosis, lymphocytosis, Eosinophilia and monocytosis were noted in third of patients. The differential T cells count indicated that, the cellular immunity was depressed among the VL, HIV, and VL / HIV co-infected patients; with decreased in CD4 number and reversed CD4/CD8 ratio. Comparison between Flowcytometry & double immunoenzymatic for CD4 counts were done for five HIV seropositive individual. Results indicated that there is a significant variation between the two methods ( $P < 0.05$ ). Sensitivity and specificity of double immunoenzymatic staining method were 100%.