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"Part II"

A Quick Qualitative Test for Identifying Human Blood Meal in Fed Female Evaluation of Complement Activation Related Pseudo Allergy (CARPA) among Sudanese visceral leishmaniasis patients treated with high single dose liposomal Amphotericin B (Ambisome®)

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Background:

Despite the fact that Liposomal Amphotericin B (Ambisome®) is in common use to treat many protozoal and fungal diseases, it was only recently studied to be used in single high dose for treatment of visceral leishmaniasis (VL). Although it has been documented that complement activation related pseudo allergy (CARPA) due to Ambisome® occurs in animals, its safety when given in high single dose was not studied in humans. Therefore, this study aimed at evaluation of CARPA among Sudanese patients with VL treated with high single dose of Ambisome®.

Materials and Methods:

This was a longitudinal study conducted at the field stations, Institute of Endemic Diseases, University of Khartoum as part of a clinical trials (Trial registration ClinicalTrials.gov NCT00832208) to develop Ambisome® as a single high dose treatment for VL. All patients with parasitologically- confirmed VL who gave written consent to participate were enrolled and allocated to receive Ambisome® either 10mg/kg single dose at day 1 or standard treatment (3 mg/kg at day 1, 2, 3, 4, 7, 14 and 21). Plasma samples were obtained immediately before treatment, day 3, 7 and 14 following Ambisome® and used for C3a, C5a and sC5b-9 measurement using Human ELISA kits. Quantitative PCR was performed serially to look for parasite load and pattern of clearance. Clinical data were collected to assess CARPA. Epi Info 7 was used for data processing and analysis.

Results & Discussion

Thirty-six (n=36) patients participated in this study. Nineteen patients treated with high single dose (G1) and 17 patients treated with standard dose of Ambisome® infusion (G2). The mean age was 10 ± 4.1 years and 11 ± 6 years, respectively. None of the patients developed CARPA. Before treatment the levels of MAC, C5a and C3a were high ($p<0.05$) and comparable in either group ($p>0.05$). At day 3 the mean levels of MAC, C5a and C3a were low compared to baseline ($p>0.05$). This could be due to waning of the inflammatory response due to reduction of the parasite load ($p=0.01$). At day 7 MAC mean level was significantly low in G2 ($p=0.02$) and also tended to decrease in G1 ($p=0.1$). C5a showed increased levels in G1 and G2 but not significant ($p=0.1$ and 0.5, respectively). This could be attributed to liposomes since the parasite load is low at this stage. Parasite load showed significant reduction among G2 ($p=0.01$) whereas the reduction was not significant in G1 ($p>0.05$). The parasite load showed direct relationship with the levels of the complement components.

Conclusion:

Visceral leishmaniasis manifests with high levels of MAC, C3a and C5a as a result of the inflammatory process. Ambisome® given in high single dose of 10 mg/kg correlates positively with activation of MAC, C5a and C3a but not sufficient to induce CARPA. Its use at such a dose is safe for patients with VL.

Immunochemotherapy of Post Kala-Azar Dermal Leishmaniasis: Sudanese Experience

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Post-Kala-Azar dermal leishmaniasis (PKDL) is a dermatosis that follows apparently successful treatment of Visceral Leishmaniasis (VL) caused by Leishmania donovani. It is believed to be immunologically-mediated. The skin lesions are viewed as reservoirs for leishmania parasites. Therefore, treatment could help in the control of VL. The available treatment options are far from satisfactory as they are either expensive (liposomal amphotericin B), toxic (antimonials), or resistant parasites have emerged or are imminent with monotherapy. A novel option is immunochemotherapy whereby a low-dose or short course of an effective drug is given with one injection of a vaccine or immunomodulator to rapidly induce the effector immune response. This is instead of relying on chemotherapy alone to reduce the parasite burden, and for the effector immune response to develop. This may take longer time to control the parasites. Sodium stibogluconate (SSG) combined with first generation candidate vaccine (Alum-precipitated autoclaved L major plus BCG) for leishmaniasis was tried in 2 studies; and in combination with second generation candidate vaccine (LeishF2 plus MPL-SE) for leishmaniasis in one study. The Treatment was evaluated by the clinical outcome, safety and the immune responses. Interestingly, the first option was found to be safe, strongly immunogenic and efficacious and studies leading to phase III are underway. In contrast, the latter option was found to be safe and immunogenic but not promising in terms of efficacy.

Paromomycin/Sodium Stibogluconate Combinations; safety and possible efficacy for treatment of Post Kala-Azar Dermal Leishmaniasis Case series

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Post kala-azar dermal leishmaniasis (PKDL) is a recognized dermatologic complication of successfully treated visceral leishmaniasis (VL). PKDL lesions are suspected to be important reservoirs for VL transmission in Sudan. Prolonged treatment schedules, feeling of general well-being and the social stigma of PKDL prevent most patients from seeking treatment. The mainstay of treatment is cardiotoxic sodium stibogluconate (SSG) for 60-120 days. Recently, liposomal amphotericin B (Ambisome ®) and immunochemotherapy gave promising results. Ambisome ® is expensive and difficult to prepare under field conditions. Paromomycin/SSG combination has been shown to be safe, efficacious and can save time in VL treatment. This report aims to prove that Paromomycin/SSG combination can cure and reduce PKDL treatment duration.

Nineteen cases of patients with PKDL lesions of ≥ 6 months duration were diagnosed by clinical signs, histopathological/immunohistochemical and PCR. Patients' mean age was 14.9±5.9 years. Nine patients (9/19; 47.4%) among whom (3/19; 15.8%) patients failed previous SSG treatment of 2-3 months duration responded completely to 40 days

of Paromomycin (single)/SSG (single) combination daily doses while (5/19; 26.3%) responded to 30 days of the Paromomycin (single)/SSG (single) combination. One patient (1/19; 5.26%) relapsed following the 30 days combination regimen.

A second group of ten patients (10/19; 52.6%) with (2/19; 10.52%) patients who failed previous SSG treatment, responded to 15-20 days of Paromomycin (double)/SSG (single) daily doses.

In conclusion, Paromomycin/SSG combinations are time-saving, safe and efficacious for PKDL treatments.

The Challenges of managing patients with kala-azar in Sudan

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Visceral leishmaniasis (kala-azar) is an increasingly recognized major health problem and is unique in Sudan. Control measures, that include case-detection, treatment with antimonial drugs and vector control, have been disappointing. Recent epidemics have been responsible for displacement of large populations, high morbidity and mortality. Practicing physicians face major problems: kala-azar endemic areas are geographically remote with inadequate health facilities. Transport from the endemic areas to central hospitals is difficult, costly and impossible during the rainy season. Moreover, civil unrest and social instability limit access to the available health services. Accurate data on the burden of kala-azar does not exist in many kala-azar foci as large proportions of kala-azar cases are not recorded. Non-governmental organizations (NGOs) are using their own protocols for diagnosis and treatment. Sodium stibogluconate (SSG) alone or in combination, although still efficient, they are not free from toxicity. Alternative drugs are numerous yet none registered in Sudan. Post kala-azar dermal leishmaniasis (PKDL) ensues in 60% of treated kala-azar. The cost of supportive treatment and treatment of concurrent diseases like AIDS and TB is always beyond the financial capabilities of the patients.

In conclusion, remote harsh endemic areas, poverty, civil unrest, toxic drugs, emerging resistance to conventional antimonials and concurrent infectious diseases remain the main challenges of managing patients with kala-azar in the Sudan.

The Pharmacokinetics of single intramuscular dose of Paromomycin sulfate, Sodium stibogluconate and their combination in healthy volunteers

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Introduction:

Pharmacokinetic properties of drugs used for treatment of visceral leishmaniasis (VL) are implicated in the variation in their efficacy. Although sodium stibogluconate (SSG) is still in use in East Africa with acceptable efficacy and safety, there is a growing interest to combine it with paromomycin (PM) to bring down its cost and improve its efficacy and safety. Available information on the pharmacokinetics of PM and SSG is limited. This study was conducted to characterize the pharmacokinetics of PM, SSG and their combination in healthy Sudanese participants and to investigate the pharmacokinetics of drug-drug interaction.

Materials and Methods:

Following informed consent, eighteen healthy males were enrolled in this study. Of them 8 participants received SSG 20 mg/kg intramuscular (IM), 5 participants received Pm 15 mg/kg IM and 5 participants had PM 15 mg/kg plus SSG 20 mg/kg. Plasma was collected at 0.25, 0.5, 1, 2, 4, 6, 8, 12 and 24 hours after administration of PM, SSG and the combination of both drugs. Urine samples were collected during 0 to 2, 2 to 4, 4 to 6, 6 to 8, 8 to 12, and 12 to 24 hours after the injections. The analysis of plasma and urine samples for PM detection and quantification was performed with a high-performance liquid chromatographic (HPLC) whereas detection and quantification of Sb was performed in a graphite furnace atomic absorption spectrometer (model VARIAN, spectra 220 FS) equipped with a graphite tube atomizer (GTA 110) and sample dispenser for graphite atomizer (Varian Pty., Ltd., Australia). Pharmacokinetic parameters were analyzed using the pharmacokinetic programme Kinetica 4.4. The cumulative amounts excreted in urine were expressed as percentage of the dose administered. The 95% CI for the difference between the means for plasma PM concentrations and urinary excretion rates were determined for the various sampling times (plasma) and urine collection times.

Results and Discussion:

Peak PM and SSG concentrations were achieved within 2 hours and it was undetectable beyond 8 hours in both participants who received PM alone and PM/SSG combination. SSG was detected after 24 hour in both groups. The mean concentrations of urinary PM at 2-4 and 4-6 hours were higher in the participants who received PM/SSG combination ($p<0.05$). Generally, most of the administered dose was excreted in the urine of volunteers within 24 hours which suggested that absorption was complete. PM half-life 2.58(hr), C max 19.5(µg/ml), T max 2(hr), AUC total 78.8 ((hr)*(µg/ml)), clearance 12.5(mg/kg*hr/(µg/ml)) and volume of distribution 47.11 (mg/kg/(µg/ml)), when given alone. PM when given in combination with SSG showed half- life 1.85 (hr), C max 18.09 (µg/ml), T max 1.25 (hr), AUC total 70.64 ((hr)*(µg/ml)), clearance 12.76 (mg/kg*hr/(µg/ml)) and volume of distribution 33.41 (mg/kg/(µg/ml)). These findings are in line with previous studies. However, the pharmacokinetics of PM was not affected significantly when it was administered with SSG.

SSG half-life 3.07(hr), C max was 48.3(µg/ml), T max 1.75(hr), AUC tot 240.97((hr)* (µg/ml), clearance 5.52 (mg/kg*hr/(µg/ml)) and volume of distribution 23.18 (mg/kg/(µg/ml)), when given alone; it showed half-life 2.81(hr), C max 40.56(µg/ml), T max 1.81(hr), AUC tot 197.74 ((hr)*(µg/ml), clearance 6.05 (mg/kg*hr/(µg/ml)), and volume of distribution 24.19 (mg/kg/(µg/ml) when given in combination with PM. Pharmacokinetic parameters of PM, SSG or PM/SSG are comparable (p>0.05).

Conclusion:

There were no significant differences between the pharmacokinetic parameters of PM and SSG. PM seems to decrease the serum concentration of SSG.

The role of Ultraviolet light - induced Treg cells in the pathogenesis of post Kala-azar dermal leishmaniasis

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Post kala-azar dermal leishmaniasis (PKDL) is a dermatosis caused by Leishmania donovani. The distribution of PKDL lesions in Sudanese patients often mirrored the clothing habits. It is most severe in or confined to the sun-exposed parts. In a previous paper, we hypothesized that UVB light might be a key player in the pathogenesis of PKDL. In this paper we show that although parasites are rarely found in the lesions by direct microscopy they could be demonstrated by PCR and Real Time PCR, while leishmania antigen is demonstrated in macrophages and epithelioid cells in all cases. We studied the cell phenotypes by immunohistochemistry and found evidence that the changes in the lesions were compatible with the effects of UVB. These changes were: the decrease in the number of CD1a (Langerhans' cells) in the epidermis at the level of penetration of UV light and those surviving lost their dendrites. These cells picked up leishmania antigen and homed for the T-cell zone of regional lymph nodes where they specifically stimulated Treg cells. The leishmania specific Treg cells were shown to infiltrate skin lesions where they suppressed cytotoxic CD8+ cells preventing them from elimination of macrophages containing residual leishmania antigens. This led to persistence of antigens and inflammation. PKDL patients had high levels of Treg cells in the peripheral blood. The cells decreased markedly after cure of PKDL. When patients developed a recurrence, the Treg cells rose up again. Various cytokines known to be induced by UVB radiation could be demonstrated in PKDL lesions.

The Signature of HLA Class II genes in Sudanese Patients with Celiac Disease

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The objective of this study was to investigate the association between HLA Class-II loci and their frequencies in Sudanese patients with celiac disease. All blood specimens from celiac disease patients (n=70), and control group (n=30) were tested for (tTG IgA, Gliadin IgG and EMA) antibodies by IIF and ELISA were repeated on all patients (n=70) to determine their response to the gluten-free diet (GFD) and to exclude the presence of the disease among control group (n=30).

HLA-class II, DR and DQ alleles were typed from the DNA of all samples. Analysis of the gel was done by using One Lambda Software. Analysis of case-control data was performed using the Chi-square test with P< 0.05 considered significant.

HLA-DRB1*0301 (HLA-DR17) was found in 74.3 % of the patients compared to 26.67% of the healthy controls (p= 0.002) and a risk factor of 4.4. The frequency of HLA-DQB1*0201 (HLA-DQ2) was found to be 81.42% and 53.3% in patients and in healthy controls respectively (p=0.006) with a risk factor of 3.8. HLA-DQB1*0301(HLA-DQ7) was found to be significantly frequent in patients (24.3%) compared to (3.3%) among the controls (p= 0.011) with a relative risk of 9.3. Interestingly HLA-DQB1*0301(HLA-DQ7) frequency was only 2% among caucasians patients. There was no significant difference between patients and controls regarding HLA-DQB1*0302 allele (HLA-DQ8) which was frequently seen in 17.14% patients compared to 30% in the controls (p=0.18) with a relative risk of 0.48. HLA-DQ7 is highly specific to Sudanese CD compared to HLA-DQ8.

F-wave Latency: ulnar nerve conduction in normal Sudanese adults

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Objectives:

The objectives of the present study were to determine the mean value for the F-latency conduction velocity on normal Sudanese adults, to assess sex and age related changes in the F-latency conduction velocity and to determine the relationship between body height, span and F-wave latency.

Materials and Methods:

A cross- sectional descriptive study on motor nerve conduction, performed on a sample of forty-five normal Sudanese adults volunteers, twenty-two males and twenty- three females of different age groups. Nerve conduction was assessed by electromyography measurements (EMG) at the Department of Physiology, Faculty of Medicine, University of Khartoum.

Results:

Forty five normal Sudanese adults of both sexes and of different age groups were investigated for F-distal latency, F-latency conduction velocity and body height and span measurements. Values obtained showed a mean value of 27.6±0.23SE for F-distal latency, 46.9±0.74SE m/sec for F–latency conduction velocity. Body height in centimetres was

found to be 169±1.96 SE for males and 165.6±1.01 SE for females with no significant difference between males and females. Span in centimetres was found to be 170.3±1.83 SE in males and 156.6±4.73 SE with significant difference between males and females.

A significant, direct relationship was revealed between body height, span and F-wave latency. The study also revealed sex-related changes in the F-latency conduction velocity with faster conduction in females. There were no age-related changes.

Conclusion:

Values of F-latency conduction velocity obtained in this study among Sudanese adults are universally similar. Sex but no age related changes in F-latency conduction velocity was suggested, with faster conduction in females. F-wave distal latency is directly proportional to body height and span.

Ulnar Nerve F-Wave Response: A Study on Normal Sudanese Adults

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Objectives:

The study objectives were to determine the mean values for the principle components of the ulnar nerve F-wave, namely: latency, amplitude, duration, in normal Sudanese adults; to compare between right and left, distal and proximal mean values of the F-wave latency; amplitude and duration and to find out sex and age-related changes in the principle components of the F-wave as well as to find a relationship between the different F-wave parameters.

Materials and Methods:

This is an observational study conducted at the Department of Physiology, Faculty of Medicine, University of Khartoum. Motor nerve conduction study was performed on one hundred normal adults of both sexes and with different age groups.

Results:

Values obtained in this study showed a mean of 27.6± 0.23 (SE) ms for F-wave distal latency, a mean of 433.75 ± 17.46 (SE) mV for F-wave distal amplitude and a mean of 6.27 ± 0.22 (SE) ms for F-wave distal duration. Comparison between right and left upper extremities in the different F-wave parameters and between distal and proximal values of the F-wave amplitude and duration showed no significant difference. The study revealed sex-related changes in F-wave distal latency and duration with shorter latency in females and shorter duration in males. No age-related changes had been shown in the study concerning latency, amplitude and duration. A significant correlation between distal and proximal values of the F-wave components as well as between F-latency and duration and between F-amplitude and duration had been suggested.

Conclusion:

Ulnar nerve F-wave components mean values in healthy Sudanese adults, seems to be universally similar. No dissimilarities between right and left or between distal and proximal values as well as no age related changes in the different F-wave parameters. F -wave latency revealed a relationship with sex while F-wave duration was more related to F-latency than to sex, with shorter latency in females' and shorter duration in males. Strong direct correlations between distal and proximal values while an indirect one between distal latency and duration and between distal amplitude and duration were also suggested.

Frequency of Simian Virus 40 DNA in Pleomorphic Adenoma

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Background:

Simian virus 40 (SV 40), is a highly oncogenic DNA tumour virus (Polyomaviridae) which was recently found to be associated with various human tumours including pleomorphic adenoma. The virus is a monkey virus which was believed to be transmitted to humans only under exceptional situations.

Objective:

The aim of this study is to investigate the presence of SV40 DNA in pleomorphic adenoma of the salivary glands among Sudanese patients.

Materials and Methods:

This is an analytical study. The study was conducted at the Oral Pathology Laboratory at the Faculty of Dentistry, University of Khartoum and the Research Laboratory of Al Neelin University. Study sample represents 30 paraffin embedded blocks for patients who had salivary gland pleomorphic adenoma and 10 paraffin embedded blocks of normal salivary gland tissues used as controls. The tissue specimens were fixed in 10% formalin, dehydrated and paraffin-embedded. The viral DNA was isolated and amplified by the PCR.

Results:

All the 10 normal salivary gland tissues and the 30 pleomorphic adenomas samples investigated in this study using PCR method were negative for the presence of SV40 DNA.

Conclusion:

The findings of this study showed the absence of SV40 DNA in salivary gland pleomorphic adenoma in the studied population. That might be due to ethnic differences between the Sudanese population and the other population found to be Simian virus DNA positive.

Treatment outcomes and patient satisfaction of immediately loaded basal implants in patients with marginal mandibulectomy

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Introduction:

Many problems were encountered when using adhesives, anatomic undercuts and clasps for maxillofacial prosthesis retention.It is thus worthy to study the treatment outcome of basal implant system in patients with marginal mandibulectomy.

Objective:

The aim of this study was to assess the treatment outcomes and patient satisfaction when using basal implants as a prosthetic reconstructive technique in patients with marginal mandibulectomy.

Materials and Methods:

Twenty five patients with marginal mandibulectomy were treated with immediately loaded fixed implant supported prosthesis using basal implant. Patients were followed for 3, 6 and 12 months after prosthesis insertion. Plaque index modified gingival index, pocket depth and calculus index were measured. The prosthesis was examined for

prosthesis mobility, decementation of the prosthesis, the amount of lip support, teeth shown, fracture of the veneer materials, presence of unnatural wear of the opposing dentition and patient satisfaction. The presence or absence of both implant loss and/or fracture was assessed using digital OPG radiograph.

Results:

The examination during the first and second follow up visits revealed that: the plaque index was 0-1, modified gingival index was 0-2, the pocket depth 0-3mm and calculus was absent. None of the patients presented with any signs of prosthesis failure. The bone implant contact was increased and none of the implants were fractured or missed.

Conclusion

The preliminary results showed that this implant system can be used successfully in treating patients with marginal mandibulectomy.

Dental Arch Form and Dimensions among Class I, II and III occlusion in a Sudanese Sample

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Background:

The identification of dental arch forms and dimensions for orthodontic patients is important in achieving stable, functional and aesthetic dentition. There are differences in arch form and dimensions among different population and among different classes of malocclusion in the same population.

Objectives:

To identify Sudanese arch form and dimensions in Class I, II and III occlusion subjects and compare it with that of White Americans to help in the proper selection of the treatment arch wire.

Materials and Methods:

Dental casts of 75 Sudanese subjects (30 Class I, 30 Class II, and 15 Class III) were scanned. The most facial portions of 13 proximal contact areas were digitized to estimate clinical bracket position for each tooth; four linear and two proportions measurements were taken.

Results:

The mean inter-canine width was 29.49±2.30 mm, and mean intermolar width was 51.64±3.24 mm. The most common arch form for Class I and III was the ovoid (43 % and 47%) and the square (43% and 47%) and the least was the tapered archform (13% and 12%). For Class II the most common arch form was the ovoid (50%), followed by the square (27%) and the tapered (7%). Differences among the three classes of malocclusion were not statistically significant regarding arch dimensions and form ($p>0.05$) .There were no significant differences between females and males in all arch dimensions measured ($p>0.05$). In Class I and II, the Sudanese sample had significantly greater inter-canine width ($p=0.004$) and inter-molar widths ($p=0.0005$) in comparison to White Americans. In Class III Sudanese showed increased inter-canine depth ($p=0.029$), inter-molar depth ($p=0.023$) and canine W/D ratio ($p=0.012$) when compared to White Americans.

Conclusion

Our results suggest that when treating Sudanese population one should expect to use preformed ovoid archform wires.

Determinants of the First Dental Visit in a Group of Sudanese Children: A Dental-Hospital Based Study

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Background:

Over the past years, discussion has focused on the age at which a child without identified dental problems should first visit a dentist. Several dental professional organizations have offered a strong rationale for making that first visit by age 1 year. The main objective of this study was to assess the determinants of the first dental visit in terms of age, chief complaint(s), treatment needed and anxiety level in a group of Sudanese children.

Methods:

This was a descriptive, cross-sectional study conducted in the paediatric dental clinics at Khartoum Teaching Dental Hospital and University of Khartoum (which are the major public paediatric dental clinics in Khartoum city). A representative sample of 215 children was targeted. Data were collected between February and May 2010. A written questionnaire was completed by direct interview of the parents/or caregivers, followed by clinical examination for the chief complaint(s), during which the child's behaviour was rated using the Frankl Behaviour Rating Scale (FBRS). Radiographs, periapical views and DPTs, were taken whenever needed to confirm diagnosis of the chief complaint and to determine the treatment needed accordingly.

Results:

The median age for the first visit was found to be 7.08 years. Most common chief complaint for the visit was dental caries (74.42 %), of which dental caries and pain constituted the majority (44.65%). Most of the children expressed Frankl level 3 (positive) during the clinical examination (57.21%). Extraction was found to be the treatment needed for almost half of the children at their first dental visit (46.98%).

Conclusion:

Sudanese children are brought very late to the paediatric dental clinics for the first time complaining mainly of caries and pain which necessitates invasive dental procedures (mostly extraction). The behaviour rating during examination was found to be mostly Frankl 3.

Open Versus Closed Treatment of Mandibular Condylar Fractures

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Background:

Closed treatment may include a period of maxillomandibular fixation (MMF) followed by functional therapy, while the surgical approach involves open reduction and internal fixation; mandibular condylar fracture management is a matter of controversy despite numerous consensus meetings on open reduction and internal fixation (ORIF). This study aims to compare the treatment outcomes of open versus closed reduction of mandibular condylar process fractures.

Materials and Methods:

This is a controlled clinical trial conducted at Khartoum Teaching Dental Hospital. A total of 26 patients were enrolled, with 13 patients assigned to each group. The variables under study were differences in the condylar process sagittal displacement, ramus height shortening, and deviation on mouth opening, malocclusion and pain perception measures on the visual analogue scale (VAS). The two groups were matched for age, gender, site and mechanism of injury and controlled for pre -existing differences in the outcome measures.

Results:

The majority of patients enrolled were males constituting 84.6% of the studied population. Pre-treatment assessment showed, the mean sagittal displacement and mean ramus height shortening in the surgical group were mm and mm, respectively. In the closed treatment group the mean displacement was and the mean value for ramus height shortening was mm. Three months post-treatment, the mean maximal mouth opening among the surgical treatment group was 4.3 ± 0.77 mm, and for the closed treatment group was 3.8 ± 0.96 mm. Post-operative absolute deviation at maximal mouth opening was significantly higher among the closed treatment group, affecting 10 (76.9%) patients (p=0.000). No significant differences were observed in the prevalence of post-operative occlusal disturbances or in the degree of pain perception.

Conclusion:

There was no significant difference in the mandibular functional capacity between the two groups; deviation on mouth opening was significantly higher among patients treated conservatively. On the other hand, surgical treatment does involve the risk of transient facial palsy and, rarely post-operative infection. There were no significant differences in the prevalence of post-operative occlusal disturbances, changes in mouth opening (inter-incisial distance) or in the degree of pain perception.

Frequency of Oral Cancer among Cancers in Sudanese Patients

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Background:

Cancer is among the ten common causes of mortality worldwide. Oral cancer is one of the cancers that have a high mortality rate. Previous studies from Sudan revealed that oral cancer is rather frequent accounting for 12.6%. This figure appears to be relatively high, probably influenced by the nature of the centres from which the data was collected resulting in a bias towards certain types of cancer. Therefore, it is worthy to conduct a comprehensive multicentre-based study to estimate the precise relative frequency of oral cancer in Sudan.

Materials and Methods:

A total of 10,680 records of cancer patients were retrieved from the Radio-Isotope Center of Khartoum (RICK) in addition to 13 different major histopathology laboratories in teaching hospitals in Khartoum state from year 2004-2008. Data collected from the records included name, age, gender, site, and type of cancer. Recurrent and metastatic cancers were excluded. The data were analysed using SPSS version 16.

Results:

Out of the 10,680 cancer records retrieved, 1003 cases were classified as oro-facial malignancy. Breast cancer was the most common cancer accounting for 12.4% followed by oral cancer accounting for 9.4%. Oral cancer was also found 2nd in order in females following breast cancer and second in order in males following prostate cancer.

Conclusion:

The findings of this study showed that in the Sudan breast cancer is the commonest cancer followed by oral cancer accounting for 12.4 % and 9.4 % respectively.

WHO simulation model Sudan (WHOMS-14): a case study of peer-assisted learning

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Background:

At a time when university resources are declining and demands upon staff are increasing, peer education poses an opportunity for students to learn generic skills. Modelling, as a form of peer education, is considered as one of the most effective informal projects that aim at developing soft skills and abilities in an interactive and creative environment.

Objective:

The aim of this intervention (WHOMS-14) was to assess the impact of a simulation project based on peer education on the learning outcomes of a group of diverse participants from the health sector.

Materials and Methods:

Phase 1 of WHOMS-14 included training of 30 trainers by expert facilitators on soft skills, public health issues and parliamentary procedures. Phase 2 marked the peer to peer training. The 30 trainees from phase 1 recruited 100 participants and transferred the knowledge they acquired in phase 1. This whole group then simulated/role-played a WHO regional committee meeting. They conducted elections and debated two public health crises affecting the Eastern Mediterranean region.

Results:

Group demographics: The simulation idea attracted a diverse group. There was representation from undergraduate (75%) and postgraduate (15%) students, students from governmental (56%), and private universities (18%) and students form outside Khartoum state (3%). Majority of the students had a dental background (35%), while others from medicine (32%), pharmacy (20%) and public health (8%). The majority were from Sudan (46%), followed by Nigeria (13.5%) and Kenya (13.5%). There were also participants from Uganda, Malawi, Niger, Rwanda, Tanzania, Mauritania, Somalia and KSA.

Pre-post evaluations: Evaluation of the trainers in phase 1 showed that 65% demonstrated an increase in their ability to utilize soft skills and 70% enjoyed the informal, interactive, training experience. In phase 2, more than three quarters of the participants reported an improvement in their knowledge on public health issues, and in their skills in presentation, communication, implementation of basic parliamentary procedures, team building, leadership, debating and negotiation. Feedback statements from interviews with participants on the impact of the model included: 'WHOMS-14 was a life changing experience'; 'I am definitely considering public health as my future career' and 'I am more confident now'. Statements from observers of the simulation meeting included: 'This simulation was better executed than the real regional committee meeting'.

Conclusion:

WHOMS-14 was able to demonstrate the usefulness of employing peer-to-peer education in delivering generic skills training, and raising the profile of public health and its essential competencies.

Periodontal Health Status among Hyperthyroidism Female Patients Attending Radiation and Isotopes Centre, Khartoum (RICK)

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Background:

Hyperthyroidism is a condition with dental implications. Limited data are available regarding the relationship between hyperthyroidism and periodontal health. Very few studies suggested a relationship between hyperthyroidism and periodontal diseases. Not a single study was done to investigate the presence of periodontal diseases among hyperthyroidism patients.

Objective:

The present study aimed to determine the presence of periodontal diseases among hyperthyroidism patients and to correlate certain variables with the severity of periodontal diseases if they are present.

Materials and Methods:

A total of 107 females attended Radiation and Isotopes Centre, Khartoum (RICK) (40 as cases and 67 as controls) aged 20 - 40 years participated in a comparative cross-sectional hospital-based study and they were conveniently selected. Cases were female patients with hyperthyroidism confirmed by radioimmunoassay and were followed up at RICK, whether they were recently diagnosed or on thyroid treatment. Controls were volunteers who were systemically healthy females with normal thyroid hormones levels. Personal data and oral hygiene practice were recorded. Oral clinical examination was done which include recording plaque index (PI), gingival index (GI), presence of calculus (CI), probing pocket depth (PPD), and clinical attachment loss (CAL). Severity of periodontal diseases, regularity of dental visits, duration of hyperthyroidism and use of medications were also assessed.

Results:

The presence of chronic periodontitis was 55% among the study group compared to 17.9 % among the controls and the difference was statistically significant (p=0.001). The presence of chronic gingivitis in the study group was 95% compared to 92.5% in the control group and the difference was statistically not significant (p=0.559). There was no statistically significant difference between cases and controls for PI, GI at the 5% significance level. However, there was a statistically significant difference between cases and controls in presence of calculus (p = 0.036), PPD (p =0.004) and CAL (p=0.001).

Conclusion:

Results of the present study showed a higher prevalence of chronic periodontitis and gingivitis among hyperthyroidism female patients attending RICK compared to a control group of the same age and oral hygiene practice. It is recommended that those patients receive more periodontal care, regular dental management and proper follow-up. Further detailed longitudinal studies are needed.

Dental Caries in 3-14 Years Sudanese Children with Bronchial Asthma

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Background:

There is lack of consensus regarding the relationship between the risk of dental caries and asthma in the child population. Despite these divergent views, most studies concluded that asthmatic children are at risk of dental caries from the disease status or its pharmacotherapy. Thus, special preventive programs are needed.

Objective:

The objectives of this study were to assess the dental caries status of asthmatic patients in the age group of 3-14 years and to examine the possible association of these conditions to various aspects of bronchial asthma and its management.

Materials and Methods:

This was a hospital-based case-control study carried out in Khartoum Specialized Children's Hospital, Omdurman Specialized Children's Hospital and randomly selected public schools and kindergartens.

One hundred and five asthmatic patients receiving treatment at Khartoum and Omdurman Children's Hospitals were studied. The children were examined for their dental caries status, and the scores were compared with a group of 112 non-asthmatic patients matched on age,gender and socioeconomic status. These were selected randomly from public schools (control group).

Caries lesions were assessed using DMFT/DMFS and dmft/dmfs index according to WHO criteria (1987). Parents or guardians provided information about oral hygiene and dietary habits by direct interview. Asthma-related data (type and form of medication, severity and duration of asthma) were collected from medical records and/or parental interview.

Results:

The mean age of asthmatics was (7.7 ±3.5) years and (7.8± 3.5) for non-asthmatics. The results showed a significantly higher prevalence and severity of dental caries among asthmatic group as compared to the non-asthmatics in both primary and permanent dentitions. The dmft was (3.70± 3.50) in the asthmatic group while it was (2.36 ± 2.69) in the non-asthmatic control group. The DMFT was (2.65 ± 2.26) in the asthmatic group while it was only (0.98 ± 1.32) in the control group.

Severity of caries attack (as measured by the number of involved tooth surfaces) was also higher among asthmatics compared to non-asthmatics in both dentitions; the dmfs was (7.84± 8.45) while it was (3.96 ± 5.11) for the controls. The DMFS was (4.01 ± 4.41) for the asthmatics while it was (1.15 ± 1.63) for the control group. All the differences were statistically significant ($P< 0.05$).

Conclusion:

Children suffering from bronchial asthma appear to be at higher risk of having caries. This risk is increased with the severity of bronchial asthma.

Outcome of a Research Ethics Training Workshop among a group of Sudanese Investigators

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Background:

International principles and guidelines that govern conduct of research are well established and implemented in the developed world. However, there is a general concern about the ethics of clinical research in developing countries. In Sudan there is increasing awareness about the importance of research with health professionals conducting most of their studies on humans. Abiding to research ethical principles and guidelines by Sudanese researchers could enhance the protection of these human subjects. There is a gap in formal training in research ethics for sponsors, investigators and members of research ethical committees.

Objective:

The objective of this study was to provide research ethics training to investigators to acquaint them with the basic knowledge and understanding of ethical principles that allows them to value the role of RECs in protecting human subjects involved in clinical research.

Materials and Methods:

A two-days workshop in research ethics was organized and consisted of interactive large group teaching as well as small group discussions of provided protocols. The course was conducted three times in different institutes with a total of 59 participants. A voluntary pre-and post-test was administered to participants in order to assess the knowledge gain from the workshop. The tests were anonymous. The knowledge assessment form consisted of 34 best answer questions and covered areas of informed consent, level of risk, conflict of interest, REC guidelines etc. Three cases were also included in the pre-test and post-test to examine level of reasoning and apprehension. Pre and post test scores were compared using a paired-samples t tests and nonparametric tests.

Results:

Only 20.9 % of the participants have attended some sort of research ethics training before that workshop even though 95.3% were active in research. The most common types of studies conducted were survey studies followed by blood and tissue sample studies, only one researcher claimed being involved in clinical trials. Participants mean score in the pre-test was 15.5 points out of 37 compared to 28.5 in the post-test; overall, post-test scores were 12.9 points higher than pre-test scores with a standard deviation of 4.1 points, this difference was statistically significant at a p level of <0.05. Non-parametric tests also showed a significant increase in the knowledge for each area tested.

Conclusion:

The workshop has enhanced the knowledge of participants about basic principles of research ethics and the role of a research ethics committee. Further assessments are needed to test the retention of their knowledge and its effect on conduct of research.

Cigarette Smoking and Porphyromonas gingivalis: A Clinical and Molecular Study among a Group of Chronic Periodontitis Patients in Khartoum, Sudan.

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Background:

Tobacco smoking is a risk factor that negatively affects periodontal health and health in general leading to serious diseases including heart and lung cancer. The aim of this study that ended in September 2012, was to investigate the influence of cigarette smoking on the periodontal health of a group of patients attending Khartoum Teaching Dental Hospital and its relation to P. gingivalis.

Materials and Methods:

Three hundred and fifty chronic periodontitis patients were recruited randomly from patients attending Khartoum Teaching Dental Hospital with an age range of 40-74 years. One hundred and eighty two were non-smokers, while one hundred and sixty eight were smokers. The two groups were examined clinically for indicators of periodontal health status including plaque levels using the Plaque Index (PI) (Silness and Loe), Gingival Index (GI) Loe and Silness, Probable Pocket Depth, Gingival Recession (R), Clinical Attachment Loss (CAL), Furcation Involvement (FI) Glickman Grade and Tooth Mobility scores (Miller 1950). Microbiologically, one hundred and sixty three chronic periodontitis patients were selected according to criteria (pocket depth ≥ 5 and bleeding on probing). Eighty nine were non-smokers while seventy four were smokers. The subgingival plaque samples were obtained from each subject, DNA extraction for P. gingivalis and quantification with an extremely powerful molecular tool, SYBR Green I assay real-time PCR technology was done.

Results:

Smokers, who showed prevalence of 48% among three hundred and fifty chronic periodontitis patients, had statistically significant higher levels of plaque compared to non-smokers ($p<0.00$). Smokers showed significantly less gingival bleeding than non-smokers 0.5% compared to 99.5% for non-smokers ($p<0.00$). Smokers showed statistically significant higher pocket depth ($p<0.00$), more gingival recession ($p<0.00$), more CAL ($p<0.00$), more furcation involvement ($p<0.00$) and more tooth mobility ($p<0.00$) compared to non-smokers. Smokers had statistically significant higher absolute counts of P. gingivalis than non-smokers, with a mean value of 212.93 ± 424.05 (CN/1000) versus 37.30 ± 45.07 (CN/1000) ($P<0.001$).

Conclusion:

Tobacco smoking has a negative impact on periodontal health. Smokers showed more plaque accumulation, less gingival bleeding, more recession, more pocket depth, more attachment loss, more furcation involvement and more tooth mobility than non-smokers. Smokers showed inferior oral hygiene standards as compared to non-smokers. Tobacco smoking modifies P. gingivalis in chronic periodontitis patients. These findings highlight the need for preventive strategies aimed at an urgent need to educate the public on the negative periodontal health consequences of cigarette smoking. Smoking cessation counselling sessions should be an integral part of dental and periodontal therapy and prevention.

Oral Health and its relation to Salivary Electrolytes and pH in Miswak and Brush Users

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Background:

Research on Miswak (Arak) use is scarce and still far from identifying the role of Miswak in the maintenance of oral health.

Objective:

This study seeks to identify the differences in oral homeostasis in Miswak and tooth brush users.

Materials and Methods:

Clinical and chemical assessments were carried out on sixty Miswak and fifty nine tooth brush users, using a non-probability sampling technique. Effects of Miswak and tooth brush use were assessed by measuring salivary and dental plaque electrolytes and pH as indicators of mineralization and oral hygiene.

Results:

Miswak users showed higher salivary calcium and sodium in the saliva and higher calcium and phosphate in the dental plaque. The pH was not different in the two groups; However, Miswak users showed significant negative correlations with pH, with calcium, phosphate and positive correlation with dental plaque sodium. Strong positive correlations were found in brush users between sodium and age and between calcium and plaque and gingival indices.

Conclusions:

It is concluded that Miswak use increases dental plaque pH and provide calcium and phosphate at low salivary pH, which is in favour of remineralisation. It increases salivary flow and therefore counteracts aging hyposalivation and decreases gingival calculus formation and subsequent gingivitis and periodontal diseases.

Eruption times of permanent teeth and the periodontal status among 5-14 years old diabetic children in Khartoum Province

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Background:

Diabetes mellitus is affecting a large portion of Sudanese children with a few studies aiming at this critical group of medically compromised children. The effects of diabetes on dental development and oral health of these children need to be established.

Objective:

This is a study of the eruption times and periodontal status of permanent teeth in 5-14 years old diabetic children attending Jaafer Ibn Oaf Children's Hospital, Omdurman Children's Hospital and Jabir Abul Izz Diabetes Center in Khartoum. The control group was students attending four public schools.

Materials and Methods:

This study is a cross-sectional, hospital-based study. The study was carried out on 161 subjects. The first group consisted of 80 subjects (1280 teeth)

with IDDM (53 females, 27 males). In the second group, there were 81 healthy subjects (1296 teeth) who did not suffer from any systemic disease (50 females, 31 males). The subjects were evaluated and divided into two groups of 5-9 years old, and 10-14 years old. The dentition of all participants was examined. Tooth eruption status was assessed and categorized into one of six eruption stages. The Plaque Index (PI) and the Gingival Index (GI) were also assessed in both groups and were compared to the level of glycaemic control in the diabetic group. The data obtained from each group were statistically analysed.

Results:

Children with IDDM exhibited a significantly accelerated eruption rates in some of their teeth, representing 28.6% of the examined teeth. The acceleration was seen only among the younger age group (5-9 years). The PI was significantly higher among the diabetic group in two sextants in comparison to the control group. The GI between the diabetics and controls in each age group was comparable, however, a higher percentage of bleeding sites was noticed among the diabetic group in both the early and late mixed dentition. No association was found between the gingival and plaque indices and the mean HbA1c in the diabetic patients.

Conclusion:

The findings obtained showed that, children with diabetes exhibit accelerated tooth eruption in some of their teeth in the early mixed dentition. Future studies need to ascertain the role of such aberrations in dental development and other complications such as malocclusion, impaired oral hygiene, and periodontal disease. The standards of care for children with diabetes should include screening and referral programs aimed at oral health promotion and disease prevention.

The Platelets to Lymphocytes Ratio (PLR) as an indicator for Malaria Severity

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Background:

Previous studies showed, the platelet-to-lymphocyte ratio (PLR) was associated with the prognosis of many tumours. However, to our knowledge, no study has explained the role of PLR in predicting malaria severity. In the present study, the predictive value of the PLR for severe disease was determined in patients with malaria.

Materials and Methods:

All patients diagnosed with malaria at a cohort of Hospitals in Khartoum State, Sudan between November 2010 and March 2014 with differential white cell counts determined within the first 24 hours after admission were included in this cross sectional study. Severe malaria was defined according to the WHO criteria. The performance of the PLR as a marker of severe malarial disease was compared back-to-back with that of C-reactive protein as a reference biomarker.

Results:

A total of 153 patients; severe falciparum malaria n=30, non-severe falciparum malaria n=104 and vivax malaria n=19) were included in the study. The median PLR of all patients was 142. PLR was significantly different between studied groups.

A significant correlation of PLR with parasitaemia was found. ROC analysis revealed a good negative predictive value but a poor positive predictive value of PLR and performance was inferior to that of CRP. After complete parasite clearance a significant rise in platelets count and lymphocyte count and a significant decrease in PLR were observed.

Conclusion:

The PLR was found to correlate with parasitaemia, but inferior to C-reactive protein as markers for severe disease in patients with malaria. The PLR is not useful as predictive markers for malaria severity in the acute care setting.

Phenotypic and genotypic characterization of bacterial species associated with nosocomial infections at Radiation and Isotopes Centre-Khartoum, Sudan.

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Background:

Cancer patients are particularly susceptible to nosocomial infections because of their compromised immune systems and treatment regimens. This study analyzed the distribution and antimicrobial resistance of nosocomial pathogens isolated from cancer patients admitted and staff noses at the Radiation and Isotopes Centre, Khartoum (RICK). It also analyzed the distribution of pathogens isolated from environmental niches, and from noses of Health care workers.

Most of the sites of the isolated nosocomial pathogens were surgical site infection , urinary tract infections , respiratory tract and blood. Environmental cotton swabs specimens were collected from infrastructures , furniture , kitchen , theaters , laboratories , offices of medical staff , and equipment.

Objective:

To investigate the impact of nosocomial infections on developing secondary infections among patients admitted to the RICK for treatment.

Methods:

This descriptive, analytical, cross-sectional study was conducted at RICK from December 2010 through December 2013. A total of 1793 specimens were collected from cancer patients, environmental niches and from the noses of heath care workers. The types of specimens collected from cancer patients were urine, stool , blood, sputum and swabs from infected wounds. The specimens were inoculated onto different types of media and that included CLED, blood agar, MacConkey agar and chocolate blood agar and were incubated aerobically and anaerobically according to the suspected organisms. Biochemical tests were done to all organisms isolated and their antibiograms were done on Melluler-Hinton agar according to the protocol set for each types of organisms isolated.

In this study we also determined the genetic diversity among several isolates from cancer patients and compared with the same isolates from hospital environments using ERIC-PCR.

Results:

Of 593 cancer patients, 519 (87.5%) were adults and 74 (12.5%) were children. The predominant microorganisms isolated from cancer patients and hospital environment were Pseudomonas aeruginosa, Escherichia coli , Klebsiella pneumoniae, Proteus mirabilis, Proteus vulgaris, Staphylococcus aureus, and Streptococcus pneumoniae. No pathogenic bacteria were isolated from collected cancer patients'.stool specimens

The majority of isolates from cancer patients and hospital environment were multidrug resistant especially to penicillin and third generation cephalosporins (ceftazidime, cefotaxime, ceftriaxone) and most of isolates were susceptible for gentamicin, imipenem, meropenem and ciprofloxacin.

A total of 120 isolates collected from cancer patients and hospitals environment were examined using ERIC-PCR fingerprinting to compare between different isolates found in both groups.? resuts

Conclusion:

The findings indicated that the hospital environment had impact on developing secondary infections among cancer patients, and may be one of the sources of infections in Oncology Centre.

Phenotyping and Molecular Genotyping of Salmonella Serotypes in Humans and Animals in Elobeid City

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Background:

Salmonella species are recognized as agents of illness and disease in both humans and animals. Infections occur worldwide in developed and developing countries and are a major contributor to morbidity and economic costs. It causes a serious health problem in developing countries through a range of human diseases such as enteric fever, gastroenteritis and bacteraemia. Many Non-Typhoid Salmonella (NTS) serovars infections result in diarrheal disease, bacteraemia and extra-intestinal focal infection in infants and more serious complications among the elderly and immunocompromised adults.

Objectives:

The study aimed to determine the prevalence of Salmonella serotypes among humans and animals (cattle, sheep and poultry) meat and eggs, to detect the antibiogram resistance patterns and to study the relatedness between human and animals isolates using phenotyping (serotyping) and molecular genotyping (RAPD) to trace the epidemiological sources in Elobied city.

Materials and Methods:

A cross-sectional descriptive study was conducted at Elobied city from August 2010 to December 2013. A total of 4,417 specimens were investigated for detection of Salmonella serotypes, 3817 from humans specimen; 3725 were stool and 92 blood specimens and 600 from cattle, sheep and poultry (400 meat and 200 were eggs). Conventional methods for isolation and biochemical identification were used, followed by API-20E and serology (polyvalent and monovalent). Antimicrobial susceptibility testing was performed using Kirby-Bauer method. The selected antibiotics were

cotrimoxazole, chloramphenicol, ciprofloxacin, amoxicillin, ceftriaxone, ceftazidime and gentamicin. Molecular genotyping for isolates was generated by RAPD-PCR using 6 primers (P1, P2, 787, 797, 784, and 1254). Data were statistically analysed using SPSS.

Results:

In 53 specimens Salmonella species were isolated and they were classified into 8 serogroup B, C1, C2-C3, E1, G, A-G, A-S and O1. The frequency of Salmonella serogroup was 14, 17, 8, 4, 2, 1, 1, and 6 respectively. The identified serotypes in group O4 were: S. entebbe (4), S. hallfold (3), S. wien (3), S. kimuenza (2), S. paratyphi B(1) and S. southampton (1). Serogroup O7 S. livingstone (2), S. langeveld (7), S. rissen (1), S. ohio (2), S. galiema (1), S. hissar (1), S. colorado (1), and (2) were untypable. Group O8 were S. heistopdenberg (1), S.fayed (3), S. limete (1), S. dunkwa (1), S. tado (1) and the only one was untypable. Group O3-10 S. ikayi (1), S. muenster (1) and 2 were untypable. Group O13 were S. give (1) and S. worthington (1) and 8 isolates from group A-S, O1 and A-G were untypable. Isolates shared between different sources were S. entebbe between poultry and patients, S. livingstone and S. wien between poultry and food handlers, S. hallflod, S. langeveld and untypable shared between 3 sources. The prevalence of Salmonella serotypes was common in summer season.

The rates of resistance were high for amoxicillin (26.4%), gentamycin (7.5%) and low against ceftazidime (3.8%), ceftriaxone (1.9%), ciprofloxacin (1.9%) and trimethoprim-sulphamethoxazole (1.9%) and no resistance against chloramphenicol. S. rissen showed multi-drug resistant (5 drugs).

Primer 2 RAPD molecular genotyping discriminated 22 serotypes and 13 untypable strains to 48 distinct profiles (genotypes) and P1254 generated 26 genetic profiles belonged to 14 serotypes and 9 untypable strains.

Conclusion:

This study concluded that, the prevalence rate of Salmonella was 1.2 %. The majority of isolates were NTS (98.1%) and (1.9%) were Salmonella typhoidal. Epidemiological typing (serotyping and genotyping) demonstrated the diversity of Salmonella serotypes and relatedness between some isolates from human and poultry. The RAPD-PCR considered as the usable epidemiological tool. S. rissen showed multi-drug resistant therefore, more comprehensive studies should be designed to trace the sources, distribution and to monitor antibiotic resistance pattern over time.

Prevalence of Abnormal Pap smears in Sudan: Implications for screening

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Background:

The Pap test is considered to be the most cost effective cancer reduction program. Cervical cancer is a common health problem in Sudan, and accounts for about 17% of all cancers in Sudanese women and is the second cause of death after breast cancer.

Objective:

To investigate the prevalence of abnormal papanicolaou smear collected from cytology laboratory archive. These samples have been taken from the women who attended the gynaecological clinics and on opportunistic screening based in Khartoum state. This data was compared with other related studies from developing countries.

Materials and Methods:

This descriptive study aimed to assess the cytological findings in cervical smears. Samples were collected from 1393 women. The smears were stained with conventional papanicolaou stain and screened by senior cytologist and abnormal cases reviewed by consultant cytopathologist. Epithelial cell abnormalities included atypical squamous cells of undetermined significance (ASC US) and above. The 2001 Bethesda System was adopted to classify the epithelial abnormalities.

Results:

Out of the 1393 cases 17 (1.2%) were reported unsatisfactory, 34 (3.1%) as epithelial cell abnormalities, and 1333 (95.7%) reported normal.

The epithelial cell abnormalities included atypical squamous cell of undermined significance (ASC-US) in 44.2 % of cases, L-SIL in 23.3%, H-SIL in 20.9%, atypical glandular cells in 2.3%, and squamous cell carcinoma and adenocarcinoma in 4.6% of cases.

Conclusion:

In this study the prevalence of abnormal Pap Smear was (3.1%). Pap smear in our study is relatively comparable to other countries.

Prevalence and Characterization of Rotavirus Recovered in Khartoum State, Sudan

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Background:

Human rotavirus which is ds RNA is the leading cause of severe diarrhoea among children less than 5 years of age. It causes more than 870000 deaths each year worldwide. It was estimated to account for 41% of hospitalized cases of acute gastroenteritis among children in Sub-Saharan Africa. In Sudan, rotavirus has been one of the important causative agents of diarrhoea among children. According to VP4 and VP7 which is used for vaccines production, the rotavirus classified into P and G genotypes,

respectively. Development of rotavirus vaccines has been a global health priority. The diversity of VP4 and VP7 rotavirus strains is a major challenge to the efficacy of the currently used vaccines. The Rotarix® vaccine was introduced on 2011 to the most gathering state (Khartoum state) although the epidemiology of human rotavirus infection is scanty in the Sudan. Therefore, in this study the VP4 and VP7 were selected for sequencing because of their capacity in protection against rotavirus.

Objectives:

The objectives were to determine the prevalence and the common clinical presentations of rotavirus A infection among Sudanese children with gastroenteritis seeking management in Khartoum hospitals and to determine the sequence of VP4 and VP7 rotavirus strains among admitted children with rotavirus infection to hospitals.

Materials and Methods:

From May to October 2010, stool samples were collected from 755 children. Rotavirus positive samples were identified by ELISA technique. From the rotavirus positive samples, RNA was extracted using the QIAamp® viral RNA mini kit and loaded on formaldehyde agarose gel and visualized under UV illumination. Omniscript® Reverse Transcription kit was used to convert RNA to cDNA. Nested PCR was done for both VP4 and VP7 using HotStarTaq®Plus PCR kit. The PCR products were sequenced and the sequence results were compared with genbank strains.

Results:

Of the 755 children, 430 (57%) were males while 325 (43%) were females. The age of children ranged between 1 to 60 months with a mean of 15.6 ± 13.3 months. In this study 121 (16%) were infected with rotavirus of whom 79 (65%) were males and 42(35%) were females 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. There was 48 of 121 positive samples which have enough PCR products for sequencing for VP4 and VP7. Of the 48 sequenced samples there were 40(83%) showed more than 98% similarity to G1P8 while 8(17%) showed more than 98% similarity to G9P8 when compared with the genbank strains. The results of nucleotide sequences obtained in this study were deposited in GenBank under accession numbers [KC741477- KC741500].

Conclusion:

This study is hospital-based so the 16% prevalence may reflect the true prevalence rate of rotavirus infection among hospitals. The presence of G1P8 as predominant strain in this study (83%) is in agreement with the introduction of the vaccine in Sudan: hence, reduction of the rate of severe disease of rotavirus gastroenteritis is anticipated. These results were obtained before the introduction of the rotavirus monovalent Rotarix™ vaccine in Sudan. The detection of (83%) G1P8 and (17%) G9P8 in this study may not reflect the real circulated strains in the Sudan; therefore further community-based study for prevalence and sequencing is needed. However this result will be of paramount importance for vaccine implementation and assessment of future rotavirus immunization program in Sudan.

Distribution of class 1 integrons and their effect on the prevalence of multi-drug resistant (MDR) Escherichia coli clinical isolates from Sudan

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Background:

Antimicrobial resistance, particularly the multidrug resistance (MDR) is an emerging serious health concern worldwide. MDR can happen through acquisition of horizontal resistance genes transfer. Integrons are mobile genetic elements located on the bacterial chromosome or a plasmid that often carry genetic determinants for antimicrobial drug resistance in Gram-negative bacilli.

Objectives:

To analyse integron gene cassettes class 1 among Escherichia coli isolates from Sudan and to determine their effect on the prevalence of resistance to antimicrobials.

Materials and Methods:

This cross-sectional study was conducted between April and August 2011 at six hospitals in Khartoum State, Sudan. E. coli (n = 133) isolated from clinical specimens of patients were included. Isolates were identified and tested for antimicrobial susceptibility following standard laboratory procedures. MDR pattern was defined as non-susceptibility to ≥ 3 antimicrobials. Class 1 integrons was detected by polymerase chain reaction and gene cassettes were characterized via sequencing analysis. Collected data were analysed, using Statistical Package for Social Sciences program (SPSS; Version 10). All p-values less than 0.05 were considered as statistically significant.

Results:

Of the 133 E. coli isolates reported, 54 of them (40.6%) harboured class 1 integrons. All the 54 integrons carriage - E. coli were found to be MDR strains. Overall, the 54 integrons-positive isolates carried different amplicons sizes, ranging between 0.25 to 2.0 kb, with the most frequent amplicon size 1.6 kb. Integrons-carriage isolates will confer higher resistant than non-integrons-carriage isolates for the most tested antimicrobial agents ($P<0.05$), and that was as follows, amoxicillin-clavulanic acid (66.7% vs. 36.7%), ceftazidime (46.3% vs. 17.7%), chloramphenicol (29.6% vs. 7.6%), ciprofloxacin (70.4% vs. 43%), tetracycline (88.9% vs. 57%) and trimethoprim-sulfamethoxazole (98.1% vs. 69.6%).

Sequencing of gene cassettes harboured 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 68% (17/25).

Conclusion:

Class 1 integrons were quite prevalent and its carriage significantly contributed to the emergence of MDR patterns and reduced susceptibility to a wide range of commonly used antimicrobial agents among clinical E. coli isolates in Sudan. Nevertheless, factors leading to the wide spread of integrons still to be determined.