

samples and detection of virulence factors Alginate, Phospholipase 'C' in these isolates.

**Methods:** This study was conducted in the Department of Microbiology St John's Medical College Hospital between September 2009 and January 2011. A total of 250 isolates of *Pseudomonas aeruginosa* obtained from various clinical samples received at the laboratory were included in this study. The isolates of *P. aeruginosa* obtained from various clinical samples were identified using standard procedures. Isolates were tested for the presence of AmpC (Disc antagonism) & MBL (Imipenem (IMP)-EDTA Combined disk test). Isolates were also screened for the production of virulence markers, Alginate, Phospholipase-C using prescribed methods.

**Results:** 12.8% of the strains produced AmpC and 18% produced MBL. One isolate was observed to produce both AmpC and MBL. In 68.8% of the isolates, no AmpC and/or MBL production was detected. 50% of the isolates produced both alginate and phospholipase C (n = 125). Alginate production was observed more among the isolates obtained from burn patients (95%), closely followed by diabetic foot ulcer (86%). Among the clinical conditions more Phospholipase producers were detected from *P. aeruginosa* isolated from burns (85%) closely followed by isolates from diabetic foot ulcer (72.3%).

**Conclusion:** *Pseudomonas aeruginosa* is an important agent causing nosocomial infections in the hospital. Virulence factors such as alginate and phospholipase C are commonly associated with these strains of *Pseudomonas aeruginosa*. AmpC and MBL production has been noticed among isolates of *Pseudomonas aeruginosa* in this study. Virulence factors such as alginate and phospholipase C were commonly associated with *Pseudomonas aeruginosa* isolates. There is a need to formulate an antibiotic policy to better utilize antibiotics in treatment of Pseudomonas infections and prevent evolution of drug resistant organisms in the hospital.

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#### Scrub typhus in India: predictors of severity and outcome

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**Background:** Scrub typhus is a chigger-borne rickettsiosis prevalent in Asia caused by *Orientia tsutsugamushi* that manifests with fever and multi-organ involvement. It causes life threatening complications if not recognized and treated early. This study was done to investigate the predictors of severity and poor outcome in patients with scrub typhus.

**Methods:** Adult patients admitted with scrub typhus confirmed by IgM ELISA and/or pathognomonic eschar to a university teaching hospital in India between March 2005 and February 2010 were included. The causative agent was further confirmed by PCR and sequence analysis of the 56-kD type-specific antigen gene on

laboratory data, and outcome, and compared those with multiple organ dysfunctions (severe scrub typhus) with those without such dysfunction and analyzed predictors of mortality.

**Results:** Six hundred and twenty-three patients with mean age of 45 years were included. Majority were agricultural workers and housewives. Mean duration of illness before presentation was 9 days with common symptoms of fever, breathlessness, nausea/vomiting and headache. Eschar was present in 43% and major complications included ARDS (33.7%), hypotension requiring inotropic support (23.1%), hepatitis with bilirubin >2.5 gm/dl (29.2%), meningoenzephalitis (18.8%) and renal impairment with creatinine >2.5 gm/dl (13.8%). Severe scrub typhus with multi-organ dysfunctions was present in 63%. Multivariate analysis for independent predictors of severity revealed the following significant factors: shortness of breath (p < 0.001), tachycardia (0.001), hypotension (0.013), hepatitis (0.04), elevated creatinine (<0.001), abnormal CSF analysis (<0.001) and ARDS (<0.001). Case fatality rate was 8.9%. Independent predictors of mortality were altered sensorium (0.01), hepatitis with bilirubin >2.5 mg/dl (0.05), hypotension requiring inotropic support (<0.001), serum creatinine >2.5 mg/dl (0.002), requirement of ventilatory support (0.007). There was a dramatic response to doxycycline in nearly all the patients who survived with mean fever defervescence duration of 2 days.

**Conclusion:** Scrub typhus is a multi-system infection causing significant morbidity and mortality in South India. Altered sensorium, hepatitis, hypotension requiring inotropic support, renal dysfunction, and requirement of ventilatory support predicted poor outcome. Early diagnosis and appropriate therapy could reduce the mortality.

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#### Latero-cervical actinomycosis in an HIV infected patient - case presentation

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**Background:** Actinomycosis is usually an indolent slowly progressive infection caused by a bacteria usually colonizing the oral cavity and is associated with an altered immune status.

**Results:** We present the case of a 34 years old patient with advanced HIV infection (stage C3 AIDS) who presents with fever, painful soft-tissue swelling involving the left laterocervical region, otalgia, loss of appetite, weight loss. The lesion slowly becomes larger and then spontaneously opens after 10 days, eliminating yellowish pus. The laboratory examination reveals a low CD4 count (3/mm<sup>3</sup>), viral HIV load of 950000 c/ml, severe anemia, leucopenia, with increased neutrophils; the biopsy showed large areas of necrosis, some with lymphocytes and damaged neutrophils and the Gram-stained smear from the pus demonstrated the presence of beaded, branched, gram-positive filamentous rods suggestive

for the diagnosis of actinomycosis. The culture was then positive for *Actinomyces israelii*. The evolution under treatment with Penicillin G, surgical debridement, antiretroviral treatment and cotrimoxazole was slowly favorable.

**Conclusion:** The diagnosis and successful management of this rare disease required the collaboration of the infectious diseases specialist, surgeon and microbiologist and the clinicians should be aware of this illness when making the differential diagnosis of latero-cervical tumors.

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#### Variations in attack rate in a single-blind, dose escalation challenge study of *Salmonella Typhi* in healthy adult volunteers

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**Background:** Typhoid fever causes significant morbidity and mortality worldwide. Efforts to develop novel vaccines that are suitable for infants and that have improved efficacy over existing vaccines has been hindered by poor understanding of protective immunity. A human challenge model of typhoid infection, using wild-type *S. Typhi* (Quailes strain) suspended in milk, was used in the 1960-70s to investigate the pathogenic mechanisms and to evaluate vaccine candidates, including the live-attenuated oral vaccine Ty21a. Subsequent challenge models of other enteric infections have used a sodium bicarbonate (NaHCO<sub>3</sub>) solution to buffer the effects of gastric acid, giving a more consistent attack rate (AR), less inter-individual variation, and permit lower challenge inocula to be used.

**Methods:** Two cohorts of 20 healthy adults were enrolled in a single-blind, dose-escalation, challenge study using *S. Typhi* (Quailes strain) suspended in a NaHCO<sub>3</sub> buffer. Participants ingested 120 mL NaHCO<sub>3</sub> solution one minute before

ingesting 1-5 × 10<sup>3</sup> (cohort 1) or 1-5 × 10<sup>4</sup> (cohort 2) colony forming units (CFU) of *S. Typhi* suspended in 30 mL NaHCO<sub>3</sub> solution. Daily review, sample collection (including blood and stool for culture) and oral temperature measurements were performed for 14-days from challenge. Typhoid fever was diagnosed in those with persistent high temperature or bacteraemia. All participants were treated with ciprofloxacin when diagnosed with typhoid fever or 14-days from challenge.

**Results:** Cohort 1 ingested a median of 1.385 × 10<sup>3</sup> CFU (range 705-1880) of *S. Typhi*; 11/20 participants developed typhoid fever (AR = 55%). Cohort 2 ingested a median of 1.9825 × 10<sup>4</sup> CFU (range 1.550-2.695 × 10<sup>4</sup>); 13/20 developed typhoid fever (AR = 65%). Higher challenge dose was associated with an earlier onset of illness (mean day of onset of 6.3 (range 4-9) vs. to 8.4 (range 4-13) respectively). Blood culture detected 87.5% of cases. The earliest bacteraemia detected by blood culture occurred four days post challenge and the latest at day 13 post challenge.

**Conclusion:** The use of a NaHCO<sub>3</sub> buffer allows infection to be induced with a lower challenge inoculum than previously observed in models using a milk buffer. Higher challenge inocula moderately increases the AR. A 65% AR is feasible, allows the study of early typhoid pathogenesis and immunobiology and could accelerate novel vaccine development.

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#### Etiological data among hospitalized patients with LRT Inflammation in the post pandemic period

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**Background:** In the post pandemic two-years period (2010-2011), LRTI was one of the main causes for incoming patients and hospitalizations at our clinic.

**Methods:** Cumulative number of patients with LRTI (including Interstitial viral or bacterial Bronchopneumonia, Pneumonia or Pleuropneumonia) in 2010 and 2011, was 2458/2387 consecutively. In 2010, 1400 were treated as outpatients; 1058 were hospitalized. In 2011, 1570 were treated as outpatients and 817 were hospitalized. From the total number of hospital healed patients, 236 and 243 patients with LRTI were treated in years 2010, 2011. This study is focused on the adult group of patients (18-91 yrs) – 187 patients in 2010, (average 49.7 years-old) and 191 patients in 2011, (average 51 years-old). Among all the hospitalized adult patients, comorbidities persisted in 69.7% of them (diabetes, HOB, CMPchr, obesitas, etc).

**Results:** In the period of 2010/2011 penumoslides were positive for IgM for Mycoplasma pn. in 5/4 blood samples; Chlamydia pn. in 4/2; Legionella pn in 3/7; Haemoph. inf. in 4/6; Influenza A in 7/3. Haemoculture was positive for *Staph. Aureus* in 2/2 patients; *Streptococcus pn.* was detected in 3/2 sputum samples and *Str.pyogenes* in 5/4 patients.

**Conclusion:** The data achieved from blood culture, sputum samples, pneumoslides, in addition to radiological signs, blood cell count (leukocytosis with granulocytosis), CRP, sedimentation, remarkable respond and improvement of patients condition to the implemented therapy, significantly points out the bacterial predominance for LRT Inflammation among hospital treated adult patients. In 2010, 7 patients had influenza A pneumonia and 3 were detected in 2011. In the period 2010/2011, 156 (83%) / 169 (88.5%) patients had Pneumococcal pneumonia. With atypical pneumonia were treated 16 patients (8.6%) in 2010; 16 patients (9.9%) in 2011. *Staphylococcus aureus* was the cause of LRT inflammation in 2 (1.1%) patients in 2010, and 2 (1%) in 2011. We have to point out that the most severe cases with pneumonia are not included in this study as they were treated in ICU.

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