Laboratory diagnosis of spinal tuberculosis: Past and Present.

SA Patwardhan, S Joshi

Abstract: Spinal tuberculosis often has an indolent course and can be a diagnostic challenge. Timely laboratory diagnosis helps to start early treatment and prevents occurrence of serious complications. Techniques such as Ziehl-Neelsen staining, histopathology and culture on solid media have been conventionally used for laboratory diagnosis of tuberculosis. Availability of liquid TB culture and molecular diagnostic tests has helped to increase the sensitivity of diagnosis and give rapid results. However, these diagnostic aids demand technical expertise and stringent quality control. High cost also limits the use of these newer techniques in poor countries which represent the greatest reservoir of tuberculosis.

A study of tubercular lymphadenitis: A comparison of various laboratory diagnostic modalities with a special reference to tubercular polymerase chain reaction

SA Patwardhan, P Bhargava, VM Bhide, DS Kelkar

Abstract: The purpose of our study was to compare various laboratory diagnostic methods, namely histopathological examination, Ziehl-Neelsen (ZN) stain, AFB culture by conventional Lowenstein–Jensen (LJ) method and fluorescence-based mycobacterial growth indicator tube (MGIT) technique and polymerase chain reaction (PCR) in clinically suspected cases of tubercular lymphadenitis.

Materials and Methods: A total of 65 lymph nodes biopsied from patients clinically suspected of having tubercular lymph nodes were included. Specimens were processed for AFB culture after NaOH-NALC concentration and inoculation on LJ medium and using the MGIT system. PCR was performed on all specimens using a commercial nested PCR kit targeting IS6110 insertion element of Mycobacterium tuberculosis complex. All lymph node specimens were subjected to histopathological examination.

Results: Of the 65 lymph nodes, 37 (56.9%) were positive on MGIT culture and 45 (69.2%) were positive by PCR. Histopathology showed maximum sensitivity (96%) but with compromised specificity (78.5%). PCR showed 90.1% sensitivity and 100% specificity. The mean turnaround time for mycobacterial growth in smear negative specimens was 30 days determined by LJ and 20 days by MGIT techniques.

Conclusion: PCR is a rapid and useful method for diagnosis of TB lymphadenitis and definitely increases the positive predictive value of a positive histopathology report. MGIT is better than LJ culture as regards time to positivity and higher yield.
Paper presentation at Public health conference at Pune University by Mrs. N. Mahale;

Effect of milk/milk product’s consumption on Holo transcobalamin, vitamin B12 and homocysteine concentrations.

Naik S, Bhide V, Babhulkar A, Mahalle N

Objective: To study the absorption of vitamin B12 present in the milk by the vitamin B12 sufficient and deficient Indian vegetarians.

Method: Eleven male and thirty female healthy vegetarian subjects were selected and grouped into two; vitamin B12 sufficient and deficient. 600 ml. of milk was given on first day and then 400 ml per day was given for next 14 days. Plasma vitamin B12, holo transcobalamin and total homocysteine levels before and after the milk load was measured. Vitamin B12 deficient subjects were also given oral supracal (containing calcium citrate and vitamin D3) tablet on 14th day followed by 600 ml of milk (200x 3).

Results: Sixteen percent from vitamin B12 sufficient and 63% from vitamin B12 deficient group were hyperhomocystinemic. Median Holo TC concentrations were 15.1 pM and 27.7 pM in vitamin B12 deficient and sufficient groups respectively. There was significant increase in the Holo TC concentrations after the milk load in deficient group (p=.0001). Regular intake of milk increased the circulating concentration of plasma vitamin B12 (p=0.018) and reduced plasma total homocysteine (tHcy) levels (p=0.044)

Winner of “Dr. C. Sita Devi Award during 38th conference of the Association of clinical Biochemists”
TITLE OF THE PROJECT:-
A study of stool carriage rates of Extended Spectrum β Lactamase (ESBL) producing E. coli and K. pneumoniae in four different groups-
a) 100 Healthy volunteers for community.
b) 100 Hospital in patients. (Critical care units)
c) 100 Hospital employees.
d) 100 patients with urinary tract infection.

Names of Principal Investigators:-
1) Dr. Pallavi Bhargava
2) Dr. Sampada Patwardhan
3) Date of Project Commencement:- August 2008.

Aims and objectives:-
E.coli and K. pneumoniae are found as commensal flora of the large intestine and are normally isolated on faecal culture. These bacteria can cause infections like urinary tract infections, wound infections, septicemia, pneumonia etc. ESBLs are enzymes produced by these bacteria that hydrolyse and inactivate β lactam antibiotics. The only class of antibiotics effective against these bacteria are carbapenems. ESBL producing bacteria are often multidrug resistant (MDR). Incidence of nosocomial infections with ESBL and MDR E. coli and K. pneumoniae is high in tertiary care hospitals all over the country. We also commonly come across community acquired infections especially urinary tract infections due to these bacteria. Our study essentially intends to evaluate the burden of these ESBL producing enterobacteria in the community and in the hospital ICU setting. This will give us a true picture of the magnitude of the problem of antibiotic resistance prevalent in the health care setting.

Materials and Methodology:-
Stool specimens of volunteers in the study are processed for aerobic culture after obtaining their written consent. Colonies suggestive of E. coli and K. pneumoniae are purified and biochemical identification is done. Antibiotic susceptibility testing and testing for ESBL production is done as per the CLSI guidelines.

6) Current status of project:-
200 volunteers have submitted stool samples for this study till date. 100 of these have been healthy people from the community. 100 specimens were collected from patients admitted in various ICUs in DMH. In 100 stool cultures from healthy community volunteers, E. coli isolates were 88 in no. and K. pneumoniae were 20 in no. Only 4.5% of all E. coli produced ESBL. None of K. pneumoniae were ESBL producing. In 100 stool cultures from patients from different ICUs, E.coli were 69 in no. & K. pneumoniae were 32 in no. 51% of E. coli and 66% of K. pneumoniae were ESBL producing strains. 10% of E. coli and 28% K. pneumoniae were Metallo β lactamase (MBL) producing implying resistance even to carbapenems. The study has clearly highlighted the significant difference in the prevalence of ESBL producing enterobacteria in the ICU setting vs in the community. Emergence of MBL producing E. coli and K. pneumoniae in the ICUs is certainly worrisome from the point of view of nosocomial infections and infection control.
Publications-
