Salmonella typhi in Gallbladder Cancer

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Citation

Y Singh, V Shukla, G Nath. *Salmonella typhi in Gallbladder Cancer*. The Internet Journal of Microbiology. 2006 Volume 4 Number 1.

Abstract

The genus Salmonella consist of bacilli that parasitise the intestine of human beings, leading to enteric fever, and the carrier state. This still remains a major health problem in the developing world. Those who became carriers are at high risk of acquiring gallbladder cancer (Nath G, 1997; Shukla, 2000). The molecular process by which chronic S.Typhi carriage promotes cancer development has yet to be determined. However, it has been suggested that the degradation of bile salts by enteric bacteria to yield carcinogenic compounds could contribute to carcinogenesis. (Aries,1969).

An unpublished data from the department of Microbiology, IMS, BHU reveals that either the bacteria remains in non-cultivable state or the growth is inhabited by some unknown component present in the gallbladder, or detection of Vi antibody is not specific for chronic typhoid carriers.

In the study conducted, a total of 101 specimens of gallbladder were collected and divided into three groups. Group A. (N=25)-gallbladder cancer. Group B (N=45)-benign gallbladder disease. Group C (N=31)-Control (from cadavers, not having any gallbladder pathology).

The samples were collected from patients peroperatively in sterile condition and gallbladder tissue were homogenized for culture enrichment. Bile and homogenized tissue were culture on blood and MacConkey agar plates and kept at 37°C. After over night incubation the plates were studied for bacterial growth. Besides, the specimens were also enriched in selinite F broth for salmonella typhi, from which subculture were done deoxycolate citrate agar (DCA) after 48 hrs and 7 days of incubation at 37°C. The isolates obtain if any were biochemically analyzed for confirmation of their identity.

The culture technique applied as above did not give positive results, but after doing Nested PCR using Flagellin H1d specific gene sequence forward (5'-TATGCCGCTACATATGATGAG-3') reveres (5'-TTAACGCAGTAAAGAGAG-3') Nested forward (5'-ACTGCTAAAACCACTACT-3') reveres (5'-TGGAGACTTCGG TCGCGTAG-3') following the method of Song et al (Song, 1993) gave positive results.

After that all the samples from patients' peroperatively in a sterile screw caped bottles and kept in 4°C container. Specimens were processed within 1 hrs of collection. The plates were incubated over night 1. Simple incubator of at 37°C 2.With candle jars at 37°C. The plates incubated over night in candle jar at 37°C gave positive results with S. Typhi.

Figure 1

Group	PCR With flagellin	Vi serology (Titer≥ 160)	Culture
A (n=25)	20 (80)*	8 (32)	13 (52)
B (n=45)	8 (17.7)	5 (11.1)	7 (15.5)
C (n=31)	2 (6.4)	NA	NA

* Figure in parenthesis show percentage. NA= not applicable.

Thus from above comparative study it is evident that PCR is the most sensitive and specific method for the detection of the bacteria followed by culture and serology.

The key to eradication of carrier state from endemic areas is widespread screening of the population. Although PCR is the most sensitive and specific method it is not cost effective for large-scale screening. Therefore, the candle jar at 37°C culture technique devised as above should be used for detecting carrier state so that appropriate control measures will greatly reduced the incidence of typhoid fever as well as carcinoma of gallbladder.

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