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ABSTRACTS

Some Research Projects Completed Recently

Role of cytostructural alterations in cervical carcinogenesis.

The study was carried out to find out the role of alterations in various cytoskeletal proteins during the process of tumour progression in uterine cervix. The cytoskeletal proteins analysed included cytokeratins (CKs) 1,10, 11, 13, 14, 16, 18 and 19 as well as the terminal differentiation protein involucrin. Tissue samples from a total of 180 subjects were studied. This included 60 non-malignant cervical tissue samples, 70 invasive carcinoma samples and 50 premalignant samples classified as cervical intraepithelial neoplasia — CIN I (mild dysplasia), CIN II (moderate dysplasia) and CIN III (severe dysplasia). Non-malignant samples were obtained from patients undergoing hysterectomy.

In non-malignant cervical epithelium CKs 13,14,18 and 19 were expressed in the basal cells while CKs 1, 10 and 11 in the spinal cells. CKs 18 and 19 were expressed intensely in endocervical cells. In precancerous lesions (CIN I, II and III), there was no expression of CKs 13,16,1,10 and 11 in the basal cells. CK 19 showed intense expression in basal cells of CIN I and no expression in CIN II and III. CK 14 was found to be intensely expressed in CIN III. In invasive carcinomas, 60 per cent or more of malignant cells were positive for CKs 19, 18, 14 and 13, showing that expression of these CKs are maintained during tumour progression from non-malignant to invasive carcinoma. CKs 1,10,11,13 and 16, however, did not show intense expression in the majority of patients analysed.

Involucrin showed intense expression in the upper spinal layers of normal and inflammatory squamous epithelium. In contrast, lesions with CIN I showed a mild staining pattern in the spinal layers (both lower and upper), whereas CIN II showed mild expression in the upper spinal layer. CIN III lesions did not express involucrin. In invasive carcinoma expression of involucrin was found to be negative in 67 out of 70 samples analysed.

It may thus be concluded that analysis of expression of CKs and involucrin provides a very useful complement to the established histologic procedures for understanding tissue pathology as well as various histogenetic pathways involved in tumour development.

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Structural and functional alterations in liver during fibrosis.

The study was carried out on adult male albino rats to find out the alterations in liver functions during dimethylnitrosamine (DMN) induced hepatic fibrosis. The rate of biosynthesis and metabolic degradation and accumulation of

different types of collagen in hepatic fibrosis as also the role of trace elements during the progression of hepatic fibrosis were also studied.

Hepatic fibrosis was induced by intraperitoneal injections of DMN (1µl/100g body wt) on 3 consecutive days of each week for 21 days. Histopathological examination of the fibrotic liver tissue showed intense neutrophilic infiltration, bile duct hyperplasia, Mallory's hyaline within cytoplasm, apoptosis of hepatocytes, dysplasia, bridging necrosis and extreme centrilobular necrosis and fibrosis. A four-fold increase of collagen content was found in the liver tissue.

A significant increase of serum aspartate transaminase (AST), alanine transaminase (ALT), γ glutamyl transpeptidase (γ-GT), alkaline phosphatase (ALP) and lactate dehydrogenase (LDH) was found. The serum albumin levels were remarkably lowered in DMN treated animals while there was a significant increase in serum globulin levels. While an induction in the biosynthesis of γ-GT and ALP in the liver was found, the AST and ALT activities were significantly reduced in the hepatic tissue. The deterioration of liver functions and modulating enzyme activities may be contributing to an extent towards the development of hepatic fibrosis.

Study of the rate of biosynthesis and metabolic degradation of collagen in DMN induced fibrotic liver revealed enhanced anabolism and catabolism of hepatic collagen. It was also found that the balance between synthesis and degradation was almost maintained in the early stages of DMN treatment as a self defence mechanism, but it was totally impaired in the later stages with a net result of accumulation of collagen in the liver.

Studies on the molecular characteristics of fibrotic liver collagen demonstrated a significant increase of ß-chains with a notable decrerase of ∝/ß ratio after DMN administration. Reduction with ß-mercaptoethanol indicated the presence of type III collagen in the electrophoretic field with a prominent increase in its level on day 21. An increase in the aldehyde content and enhanced rate of fibril formation in DMN induced liver collagen indicated a higher degree of cross linking.

Studies on minerals and trace elements during the progression of hepatic fibrosis revealed significant decreae of Ca, Mg, K, Na, Se and Zn in serum. The results indicate that exacerbation of hepatic fibrosis with ascites plays a major role in the alteration of essential elements which can further aggravate the disease.

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85TH ANNIVERSARY CELEBRATIONS OF ICMR

Virus diseases (other than AIDS) was the theme selected for the disseminaton of scientific information to various groups of people in the month of March 1996.

The National Institute of Cholera and Enteric Diseases, Calcutta, organised an awareness programme on the subject for students of the National Medical College, Calcutta and staff of the NICED highlighting the activities of the ICMR's National Institute of Virology, Pune. The programme included a lecture on viral diseases by Dr. Manish Chakraborty, former Director, Calcutta School of Tropical Medicine, Calcutta, as well as a poster exhibition on the subject.

The Centre for Research in Medical Entomology Madurai, celebrated the 85th Anniversary of the Council and the National Science Day together on February 28, 1996 by organising a symposium on viral diseases. Apart from the lectures/discussions, the Centre also organised an exhibition and a quiz competition for school children.

The Regional Medical Research Centre for Tribals, Jabalpur, organised talks/discussions on common viral diseases at the Kundam Block of Jabalpur district. Approximately 500 individuals including women and children participated in the programme.