Enteric coronavirus in symptomless homosexuals

In January 1984 we started a small prospective study of enteric pathogens in male homosexuals attending a genitourinary medicine clinic. At their first attendance patients seen by one of us (MNB) and admitting to be homosexuals were asked to submit a stool sample to the laboratory.

Stool specimens were cultured for salmonellae, shigellae, and campylobacters using standard methods and were examined for parasites by light microscopy on direct preparations and after formol-ether concentration. Heat fixed faecal smears were examined for Cryptosporidium using a phenol-aureamine stain. Where sufficient material was available, stools were prepared and examined for viruses by electron microscopy.

About 25% of patients submitted specimens as requested. The table shows the results. These confirm the prevalence of enteric parasites previously reported in homosexuals. The most striking finding of the survey, however, was the identification of coronaviruses by electron microscopy in eight of 23 (35%) of specimens (figure). By contrast, of 96 samples routinely submitted to the laboratory over the period of study from adult males aged between 18 and 50, only one was positive for coronavirus. This patient was a homosexual who was subsequently diagnosed as having acquired immune deficiency syndrome (AIDS).

Coronaviruses are well known to be causative agents of respiratory disease. In addition, enteric coronaviruses have been associated with some outbreaks of gastroenteritis and malabsorption.

Enteric coronaviruses, however, have also been found in institutionalised patients without overt signs of illness, and their excretion may be protracted lasting up to several years. In the general population the pathological importance of excretion of enteric coronaviruses is not understood but may be indicative of poor hygienic standards.

The prevalence of enteric coronaviruses in male homosexuals in our study is very striking, and it is interesting that a recent study by Kern in Germany showed that 50% of patients with AIDS were excreting enteric coronaviruses whereas no virus particles were found in 18 control homosexuals.

Although sera are available from our patients, we have not felt ethically justified in retrospectively testing them for HIV antibody without their consent. It would be

### References

endotoxin in the serum is found more often than in other types of viral hepatitis. The pyrogenic response induced by the endotoxin most probably explains why fever is a more common finding in human hepatitis A virus infection than in hepatitis B virus or hepatitis non-A, non-B virus infections. Moreover, the striking increase in serum IgM values, again characteristic of human hepatitis A virus infection, is not only the result of an increased production of IgM against hepatitis A virus but also reflects a non-specific increase in IgM, in part directed against enteric bacteria. Consequently, a dysfunction of the Kupffer cells in human hepatitis A virus infection has been postulated.

We had the opportunity to look for morphological evidence supporting this hypothesis. We received fresh unfixed liver tissue from a patient with serologically confirmed acute hepatitis A virus infection, taken three days after the onset of jaundice.

Routine histology showed portal and periporal inflammation with concomitant acinar zone 1 necrosis. Using monoclonal anti-hepatitis A virus antibodies, generously donated by Dr A MacGregor (Commonwealth Serum Laboratories, Australia), a granular immunoreactivity was observed in the macrophages bordering the inflammatory infiltrate and localized in zone 1 of the parenchyma. Hepatitis A virus antigens were absent in hepatocytes. On electron microscopy, empty and full particles, as previously described in hepatitis A virus infection, were noted in secondary lysosomes of large macrophages. In spite of extensive search no such structures could be identified in the surrounding liver cells. On immunoelectron microscopy, however, hepatitis A virus antigens were shown on the membranes of the rough endoplasmatic reticulum in some hepatocytes.

In view of these findings we propose that the presence of particles like hepatitis A virus in zone 1 macrophages, resulting from either the phagocytic function of these cells or from their primary infection, causes the clearance dysfunction of Kupffer cells and hence is responsible for the clinical and biochemical findings in human hepatitis A virus infection mentioned here.


discuss the role of the microorganisms present in the stool samples and their potential correlations with different conditions. The presence of specific organisms such as Salmonella, Shigella, Campylobacter, Entamoeba histolytica, Entamoeba coli, Giardia lamblia, Cryptosporidium, and virus particles were noted. The study highlights the importance of examining stool samples for a comprehensive understanding of gastrointestinal infections.


discuss the role of the microorganisms present in the stool samples and their potential correlations with different conditions. The presence of specific organisms such as Salmonella, Shigella, Campylobacter, Entamoeba histolytica, Entamoeba coli, Giardia lamblia, Cryptosporidium, and virus particles were noted. The study highlights the importance of examining stool samples for a comprehensive understanding of gastrointestinal infections.


discuss the role of the microorganisms present in the stool samples and their potential correlations with different conditions. The presence of specific organisms such as Salmonella, Shigella, Campylobacter, Entamoeba histolytica, Entamoeba coli, Giardia lamblia, Cryptosporidium, and virus particles were noted. The study highlights the importance of examining stool samples for a comprehensive understanding of gastrointestinal infections.


discuss the role of the microorganisms present in the stool samples and their potential correlations with different conditions. The presence of specific organisms such as Salmonella, Shigella, Campylobacter, Entamoeba histolytica, Entamoeba coli, Giardia lamblia, Cryptosporidium, and virus particles were noted. The study highlights the importance of examining stool samples for a comprehensive understanding of gastrointestinal infections.