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LETTER TO EDITOR

Microbial Causes Of Apparently Non Infectious Diseases

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Dear Editor,

Microbial causes of diseases previously believed to be noninfectious in origin, are increasingly being recognized[1]. Even though the association of *Streptococcus pyogenes* with rheumatic heart disease is well known, it was the discovery of *Helicobacter pylori* as a cause of peptic ulcer disease that revolutionized the significance of the hypothesis that microbial agents may contribute to the pathogenesis of apparently non infectious diseases. Establishment of the aetiology of human infections has traditionally relied on cultivation of microorganisms and a demonstration of infection in animal models, i.e., Koch's postulates. However, the advent of molecular biology techniques has made the association of these agents simpler. Another example includes the identification of *Chlamydia pneumoniae* in atherosclerotic plaques, thereby associating the agent with myocardial infarction[2]. Few other examples are tabulated in (Table/Fig 1).

(Table/Fig 1)

Condition/Disease	Organisms Associated
Bell's palsy [1]	<i>Herpes simplex virus-1</i>
Whipple's disease[4]	<i>Tropheryma whippelii</i>
Guillain-Barre syndrome[5]	<i>Campylobacter jejuni</i>
Haemolytic uremic syndrome[6]	<i>Escherichia coli</i>
Diabetes mellitus[7]	<i>Rubeola , Bordetella pertussis, Hepatitis, Rubella, Coxsackievirus, Epstein-Barr virus.</i>

Apart from the few examples cited above, there are a host of articles associating microbes with diseases ranging from psychiatric conditions to cancers. A few already established microbial causes of chronic diseases with their possible mechanism of causation have been tabulated in (Table/Fig 2)

(Table/Fig 2)

Organism	Direct cause	Indirect cause	Mechanism
Human papilloma virus 16, 18	cervical cancers	Oropharyngeal cancers, carcinoma of penis and rectum.	Viral DNA remains in basal epithelial cells and can reactivate resulting in malignant transformation.
Hepatitis viruses (B/C)	Hepatitis	Essential mixed cryoglobulinemia, Polyarthrits, Rheumatoid arthritis, SLE Polymyositis/ dermatomyositis, Polyarteritis nodosa,	Autoimmune hepatitis.[8]
Hepatitis viruses (B/C)	Hepatitis	Hepatocellular carcinoma	Chronic active hepatitis denoted by presence of HBV DNA and Hepatitis B e Antigen.[9]
Epstein-Barr virus	Glandular fever	Burkitt's lymphoma, Hodgkin's lymphoma, Nasopharyngeal carcinoma, B-cell lymphoma	B-cell proliferation due to 8,14 translocation.[10]
<i>Helicobacter pylori</i>	Antral gastritis, Peptic ulcer	Adenocarcinoma, Gastric lymphoma, maltoma	Chronic gastritis Proliferation of MALT

Most importantly, the significance of the hypothesis that certain infectious agents contribute to chronic disease process, is related to the possibility that interventions such as vaccines or antimicrobial therapy may be effective in the primary or secondary prevention of these conditions. For instance, azithromycin is a prophylactic for atherosclerosis [11].

azithromycin prevents it in a rabbit model. Circulation 1998; 97:633-36.

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