EDITORIAL

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WHITHER SMJ?

The Singapore Medical Journal (SMJ) has come a long way since its birth in 1960. Successive editors with their editorial boards have sought to improve the standard of the Journal which is the scientific publication of the Singapore Medical Association (SMA). Where do we go from here? Our inheritance should not be squandered. Its value should be increased.

"Scientific editors are by nature dedicated to preserving and updating the quality of their journals and committed to publishing new scientific information as expeditiously as possible." The Editor is grateful to members of the SMA who have volunteered their services on the Editorial Board. Even then the length and breadth of medicine is such that neither one person, nor ten persons, can know enough in depth about the various papers submitted which come from near and far. We assume that authors are honest enough to state the truth; that fraudulent data will not appear because it is physically impossible to verify all this. The readers of the SMJ have a vital role to play in helping maintain the quality of the SMJ. They do so by willingly corresponding in pages of the SMJ through comments, criticisms and differing points of view. They do so by writing in and using their names and designations. Pseudonyms are unwarranted. Healthy discussion is what should take place. The Editorial Board cannot help but at times run into controversial matters. We hope to begin a peer review process knowing full well the delay it may cause to publication as well as the pitfalls of such a process. To do this successfully more names than those on the Board will be required. We will acknowledge all the help received.

Space and cost are paramount considerations. To increase the number of papers published, the format of each article will be modified to save space. Authors are urged to strictly conform to "Instructions to Authors", and to return corrected scripts within the date lines specified. All this will smoothen the process of getting out the SMJ on time, a SMJ that you can be proud of.

Research is a basic foundation of sound medical practice. While we stand in awe at high technology and expensive research from overseas centres, we should never despise the simple, clinical papers. Often research means to search out again even the old things we take for granted; to see if in the light of modern medicines and a changing environment, the practices of yesteryears are still the best means to help our patients; to see if introduction of practical new technology should remould our thinking and way of approaching certain problems; and more. There is not a question too small to ask, whose answers are yet unknown. There is no research wasted even if unpublished because the process of doing it is in itself a good form of training. The belief that negative findings, lack of correlation or absence of an earthshattering result makes the article worthless should be dispelled.

Great oaks from little acorns grow. We have to start small. The medical officer or trainee should be encouraged to do research. Overseas, research programmes are planned and there are takers who will forgo clinical work to do their research training. Sure, the young medical officer needs guidance; he needs encouragement and he needs patience.

Editorials would be written to highlight issues and guide thinking. Current practices would be commented upon. Again it is beyond the Editorial Board to do all this — we will seek help to keep this going and we know those who are approached will prove themselves equal to the task.

Multi-authored papers seem in vogue overseas. Collaborative studies, multi-centre trials and large research laboratories and professional units generate many such papers. But ask this question, "Does not the excessive numbers of authors on a manuscript smack of padding the bibliography of less productive investigators or assisting a colleague with academic promotion?" Surely, the actual involvement in the collection and analysis of data is limited to at most two or three persons. Usually one contributor writes the manuscript and others criticise it without being otherwise involved. They should be acknowledged rather than given coauthorship.

We hope for ongoing dialogue. We have a responsibility. Your help will always be appreciated, your encouragement valued.

LEADING ARTICLE

ENTEROPATHOGENICITY OF E. COLI

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Escherichia coli has long been recognised as a commensal of the gut of man and animals. Its presence in food and water, therefore, indicates faecal contamination, but is not always correlated with the presence of enteric pathogens. However, studies have established that some types of *E. coli* produce severe diseases in man. The pathogenicity of these strains is attributed to virulence factors such as a) colonization factors which enable the bacteria to attach to mucous membrane and proliferate at the site of action; b) Endotoxins which are released from the bacteria in the blood stream; c) Exotoxins like the heat-labile (LT) and heat-stable (ST) enterotoxins; d) Enteroinvasiveness and e) Cytotoxin.

The *E. coli* strains associated with gastrointestinal infections can be divided into 4 groups: Enterotoxigenic *E. coli* (ETEC); enterohaemorrhagic *E. coli* (EHEC); enteroinvasive *E. coli* (EIEC) and enteropathogenic *E. coli* (EPEC).

The ETEC colonizes in the small intestine producing enterotoxins which cause cholera-like diarrhoea in man. The disease is prevalent in the tropical and developing countries, and is found more often in children than adults. ETEC-producing diarrhoea is not important in areas where the standard of hygiene is high. The enterotoxins, LT and ST, are plasmid-mediated and produce diarrhoea as a result of the action of one or two of the enterotoxins combined. The LT is immunologically similar to the subunits A and B of the *Vibrio cholerae* enterotoxin. Several methods have been developed for the LT detection, but few for ST as the mechanisms of the ST are not fully understood. Detection of the LT can be carried out by the ligated rabbit ileal loop method and tissue culture methods using cell lines eg the Y1 mouse adrenal cell, Chinese hamster ovary and a wide range of immunological tests such as the enzyme-linked immunosorbent assay (ELISA), passive immune haemolysis, solid-phase radioimmunoaassay, Staphylococcal coagglutination, latex particle agglutination, reversed passive latex agglutination (RPLA), precipitin (Biken) test and more recently, the DNA hybridization techniques. The standard test for ST detection is the suckling mouse assay. To date, the Biken test and the ELISA using monoclonal antibodies have also be tested.

In 1982, during the two outbreaks of bloody diarrhoea in the U.S.(1), some *E. coli* strains were found to produce a cytotoxin which was cytotoxic for Vero cells, thus referred to as verotoxin (VT). This VT-producing *E. coli* belongs to a number of O-serotypes which are closely associated with haemolytic uraemia syndrome and one of them (serotype 0157:H7) has been linked with haemorrhagic colitis. The non-sorbitol fermenting property of the EHEC. (95% of other *E. coli* are positive) and DNA probes can be used to detect the enterohaemorrhagic strains.

The enteroinvasive *E. coli* has the ability to invade colonic mucosal cells and produce a dysentery-like disease. The EIEC can be demonstrated by the production of keratoconjunctivitis in guinea pigs (Sereny test), multiplication in HeLa and HEp-2 cells, and DNA hybridization techniques. Studies have shown that most of the EIEC strains are lysine-decarboxylase negative, but further data will be necessary to substantiate the correlation between this biochemical behaviour and the invasiveness of a large number of *E. coli* strains(2).

The enteropathogenic *E. coli* is a common cause of diarrhoea in infants and children. In 1983 15 O-serogroups of *E. coli* are recognised as enteropathogenic to man by the WHO International Centre. The EPEC strains are epidemiologically incriminated as pathogens but the mechanisms of pathogenicity are still not well understood. Many laboratories have stopped serotyping the EPEC isolated from diarrhoel stools of young children. However, recent experiments have shown that EPEC can cause intestinal secretion and diarrhoea in man and animals(3). These findings were supported by a study reported in Bangladesh (4). The role of EPEC as an important cause of diarrhoea in children should thus be reconsidered.

Several studies have been carried out to evaluate the methods developed for the LT detection. In one study(5) for example, the efficacy of three immunological methods (Biken test, Staphylococcal coagglutination and GM1-ELISA) were compared using 100 *E. coli* strains. All 3 tests were found satisfactory and suitable for laboratory use. In another study(6), 312 *E. coli* strains were tested by the Biken test and GM1-ELISA, with Y1 adrenal cell assay as the reference technique. Results showed that both tests were suitable for screening large numbers of *E. coli* strains and that the Biken test and the GM1-ELISA were equally sensitive as compared to the Y1 adrenal cell assay. However in the study reported in this journal, GM1-ELISA was found to be more sensitive than the Biken assay kit. The authors postulated that this could be due to the titre of anti-LT used in the Biken assay and that a re-evaluation with another batch of anti-LT should be done.

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Recent developments in DNA hybridization technique for the identification of microorganisms indicates its potential use as the technique for the diagnosis of ETEC-related diarrhoea in routine laboratories. As most of the tests for LT detection are expensive or not commercially available for use in routine laboratories, a simple method, reversed passive latex agglutination, has been adopted for use in the Enteric Bacteriology Laboratory Singapore, to detect the LT-producing ETEC isolated from watery stools. Findings from a recent study (7) conducted locally on 193 diarrhoeal stools of all ages showed that 7 stools (3.6%) were positive for ETEC and 5 stools (2.6%) for EPEC.

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