Thesis Title COMPARISON OF IMMUNOFLUORESCENCE AND COAGGLUTINATION TESTS FOR THE RAPID IDENTIFICATION OF BACTEROIDES FRAGILIS AND THE STUDY OF ITS ANTIMICROBIAL SUSCEPTIBILITY PATTERNS

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ABSTRACT

Bacteroides fragilis, one of the highly virulent pathogenic anaerobic bacteria, were rapidly identified by two immunological methods including coagglutination (COA) and indirect fluorescent antibody (IFA) by using antiserum raised against whole live B. fragilis ATCC 23745. The findings were compared with those of the conventional anaerobic bacteriological tests. Of 111 proven strains of B. fragilis

by biochemical profiles, 103 strains were identified by the COA test and all strains were identified by the IFA test, with a sensitivity of 92.8 and 100 per cent, respectively. The differences were statistically significant (P=0.0020). The specificity was 97.4 per cent for the COA test and 95.7 per cent for the IFA test. The efficiency was 95.2 per cent for the COA test and 97.8 per cent for the IFA test. These differences of the latter both tests were not statistically significant (P=0.2358 and 0.0630, respectively). Cross-reactions were 3 strains (2.6 per cent) for the COA test and 5 strains (4.3 per cent) for the IFA test of 116 strains of other gram-negative anaerobes and facultative anaerobes other than B. fragilis, which all belonged to B. distasonis. The results showed that the IFA is an excellent method for identifying strains of B. fragilis and the COA may be valuable test for the adjunction in mostly small laboratories without the requirement of costly special equipments.

In addition, the susceptibilities of 109 B. fragilis strains were determined by the standard agar dilution method against beta-lactam antibiotics including imipenem, cefoxi-tin, cefotaxime, moxalactam, augmentin and penicillin G and non beta-lactams including clindamycin and metronidazole. At the fully susceptible levels indicated by the National Committee for Clinical Laboratory Standards (NCCLS), B.

fragilis were susceptible to imipenem, metronidazole, augmentin, moxalactam, cefoxitin, cefotaxime, clindamycin, and penicillin G with 100,98,97,95,80,76,50, and 0 per cent, respectively. For all beta-lactams studied, *B. fragilis* were more susceptible to imipenem than cefoxitin, cefotaxime and penicillin G, these were statistically significant ($P<0.0010$). However, when imipenem was compared with moxalactam and augmentin, these differences were not statistically significant ($P=0.0119$ and 0.0401, respectively).

In cephem group together, when moxalactam and cefotaxime (third generation cephalosporins) were compared with cefoxitin (second generation cephalosporins), the differences of the susceptibilities of *B. fragilis* were not statistically significant ($P=0.0107$ and 0.2877, respectively). In penam group together, *B. fragilis* were more susceptible to augmentin than penicillin G, these were statistically significant ($P<0.0010$). For non beta-lactams studied, *B. fragilis* were more susceptible to metronidazole than clindamycin, these were statistically significant ($P<0.0010$).

When imipenem was compared with clindamycin (non beta-lactam), the differences of their susceptibility were statistically significant ($P<0.0010$) but for metronidazole, the differences were not statistically significant from that of imipenem ($P=0.0778$). These data showed that imipenem was the most effective agent overall tested, whereas clinda

mycin was the least effective agent, and all strains of B. fragilis tested were resistant to penicillin G. About 95 per cent of 109 B. fragilis strains produced beta-lactamase, suggesting a need for the antimicrobial agent which is very potent against most beta-lactamase producing strains.