DEVELOPMENT OF A PROTOTYPE COMPUTER BASED MEDICAL DECISION SUPPORT SYSTEM THAT UTILIZES 'SENSITIVITY' AND 'SPECIFICITY' OF A CLINICAL FEATURE FOR DIAGNOSIS: A NOVEL APPROACH

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A preliminary study was undertaken to develop a prototype computer based decision support system to bé used in parallel with the doctors' decision making process. A relational database was developed using 25 clinical features and 10 common diseases. The relationship between diseases and clinical features was established by a sensitivity and a specificity value for each clinical feature and the respective disease. A clinical expert arbitrarily determined the sensitivity and specificity values. A simple decision algorithm based on probability values was used to reach the diagnosis. The database was built using Microsoft Access. The program with user interfaces for data entry, windows for diagnostic results and refine diagnostics was developed in Visual Basic environment.

The output window provides the user with 5 most likely diagnoses with a display of ranked probability values. This differential diagnosis can be refined repetitively using new information. The system was validated against the true diagnoses of 26 patients admitted to the Intensive care unit, Teaching hospital, Peradeniya. The patients entered were suffering from the diseases considered in this decision support system. The prototype decision support system was able to predict the true diagnosis with a sensitivity value of 88% as rank 1 and 96% in rank 1 or 2. This performance may be further improved by a self adaptive mechanism gathering its own experience.

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