Computer Software has been used to supplement and improve pharmacology teaching for at least two decades. It has helped to partially replace animal experiments for undergraduate medical and pharmacy students with simulations. These have achieved learning objectives, while reducing the dependency on animal experiments. In addition, software has also been used to assist pharmacology classroom teaching. Computer-based programs enable students to learn at their own pace, as well as to reinforce their knowledge through any number of revisions. Although a number of software programs are commercially available, many are unaffordable by students for individual use. This paper describes a web browser-based free software that is designed to teach medical students the optimum antibiotic treatment for urinary tract infections.

This software, ‘Antibiotic treatment of urinary tract infections’ has been designed with the objective that because urinary tract infections are very common, any material that helps medical students brush up their knowledge of this topic would undoubtedly be useful. Additionally, this topic is included in the syllabus of most universities. Most standard undergraduate pharmacology textbooks discuss the treatment of urinary tract infections, but they provide limited information about the appropriate antibiotics according to patient characteristics such as age, sex, as well as the duration of therapy.

This software has been designed and implemented as a series of web pages using hypertext mark up language (HTML). This has the advantage that it can be put up on the web at a future date and students can have easy access to it. The second reason for using it is to emphasize that pharmacologists do not have to be programmers to design such educational tools - they can easily design such modules with a little bit of learning about HTML, and make a big difference to classroom teaching.

These series of web pages are easy to navigate. Any student who uses the Internet will find this program easy to use. All that the student has to do is to click on the relevant links. A menu is provided to assist in navigation. Graphics have been put up to make it more interesting, while at the same time care has been taken not to put too many or too large graphics which increase the time taken to load the pages, and may affect student learning.

The first page has a start button, clicking on which leads the student to the actual document. First, the student is asked whether the patient is a child or an adult. It is necessary for the student to consider this first because some antibiotics commonly used for urinary tract infections in adults, for example, fluoroquinolones should not be used in children. The antibiotics for children are listed for mild, as well as severe infection along with their dose and duration of therapy. A trade name for each drug is given. Although this may not be necessary for undergraduate students, it has been mentioned...
to make the information complete. Clicking on each antibiotic name gives important information about the drug including adverse effects, contraindications, and special precautions. A ‘back’ button is provided to go back to the previous page.

Other pages are similarly designed. Treatment in adults is based on the sex of the patient. Urinary tract infections are more common in women. Here again, treatment in pregnancy differs from nonpregnant women because some drugs such as fluoroquinolones can affect the fetus. Nonpregnant women can be treated with a number of drugs. The treatment is based on the site of infections, that is, whether it is urethritis, cystitis, or pyelonephritis. Treatment of urethritis should cover both chlamydia and gonococci. Cystitis is most common in women, which may be acute or recurrent. Although different durations of therapy have been advised for acute cystitis, the most commonly accepted duration (i.e., 3 days) has been mentioned. Treatment for acute, as well as recurrent pyelonephritis is also mentioned.

Treatment of urinary infections in men depends on whether the prostate is involved, because incomplete treatment of prostatitis can lead to recurrent infections. A further decision depends on whether the infection is in the lower or upper urinary tract.

As seen in the preceding text, the choice of antibiotics in urinary infection is based mainly on patient characteristics such as age, sex, and site of infection. The infecting organism has not been considered here because the initial therapy of uncomplicated urinary tract infections is usually based on empirical therapy.

How can this software help students?

Firstly, it emphasizes that antibiotics should be carefully selected and not arbitrarily chosen. It mentions important drug-related aspects that students ought to remember while prescribing. Secondly, it can supplement a lecture on the same topic to make it more interesting, and drive home important facts. Thirdly, it can supplement clinical-case discussion and prescription writing. Therefore, this software can help students apply their knowledge in a better manner when they actually start prescribing.

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References