

Proceedings of the 2nd National Workshop on Rational Use of Antibiotics in China

Compiled by

Michelle Sweidan, Yan Zhang, Ken Harvey, YongHong Yang, Xuzhuang Shen and Kaihu Yao

The 2nd National Workshop on Rational Use of Antibiotics in China was held in Beijing from 28-30th November 2005. The workshop was organised by Professor YongHong Yang (Beijing Children's Hospital), Dr Ken Harvey (LaTrobe University, Australia) and Dr K Balasubramaniam (Health Action International Asia-Pacific). The meeting was sponsored by Health Action International Asia-Pacific and supported by the China Health Program of La Trobe University, the Australian National Prescribing Service and Medicare Australia.

For further information contact Prof. YongHong Yang: yjh66@vip.sina.com



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Introduction

World-wide concern about increasing antibiotic resistance has focused attention on the need to improve antibiotic use. In the early 1990s it was recognised that there was inappropriate antibiotic use in China as in other countries. In 1994 the 1st National Workshop on Rational Use of Antibiotics in China was held in Beijing. Since then, further research has been undertaken on antibiotic resistance and antibiotic use in China. More recently, national antibiotic guidelines have been published and national surveillance systems to monitor antibiotic resistance and antibiotic use have been established. It was considered timely to organise a second workshop on this subject in order to review the current situation and discuss strategies that might further improve antibiotic use in China.

The workshop was attended by directors, senior clinicians and pharmacists from Chinese hospitals, universities and professional associations, as well as representatives from the WHO Beijing office, Chinese Ministry of Health and Ministry of Science and Technology, State Food & Drug Administration, China CDC and Beijing City Health Bureau. Australian speakers came from La Trobe University, the National Prescribing Service and Medicare Australia. In addition to lectures, small group sessions gave all participants ample opportunity to put forward their own views and discuss the conference recommendations.

The workshop booklet containing the program, participant list, PowerPoint presentations and other relevant material is available for download (please note that this is a large 6.4 Meg zipped PDF file): http://www.medreach.com.au/Downloads/Conference_booklet.zip



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Overview of papers presented

Antibiotic use and antibiotic resistance in China

Antibiotic use in hospitals

A number of papers describing antibiotic use in hospitals in China were presented. The first was a study of surgical prophylaxis in a major teaching hospital in Beijing. The aim was to evaluate antibiotic prescribing patterns amongst surgeons before and after an educational intervention. In addition, qualitative data about factors influencing antibiotic use was obtained. The results showed excessive and frequently irrational use of newer broad-spectrum antibiotics (predominantly 2nd and 3rd generation cephalosporins and fluoroquinolones) for clean and clean-contaminated surgery. The intervention (guidelines, education and feedback of audit results) did not result in significant improvements in prescribing. Qualitative research suggested that the main determinant of this behaviour was government policy which expected hospitals to maintain their financial viability by selling expensive drugs (and investigations). In addition, focus group and interview participants noted excessive reliance on the pharmaceutical industry for drug information, low salaries (which increased the temptation to take industry “kick-backs”), concerns about litigation by patients, and insufficient knowledge of rational drug use. The author concluded that improving antibiotic use in China would require hospital funding reform, health insurance system improvement, more authoritative best-practice guidelines, hospital authorities embracing quality improvement and greater international collaboration.

A series of papers provided preliminary results of a large multi-centre collaborative study of antibiotic use and bacterial resistance in five paediatric hospitals in Beijing, Shanghai, Guangzhou and Chongqing. The aim was to document antibiotic use and expenditure in selected in-patients and out-patients and to monitor changes in antibacterial resistance over time for a range of common pathogens. Results were reported for 2002-2004; they varied between hospitals but, in general, income from sale of drugs accounted for around 45-50% of total hospital income with about half of that coming from antibiotics. A high proportion of inpatients in the wards surveyed received antibiotics (85-100%) resulting in considerable expense for the patient. Around 50% of children seen in outpatient clinics were prescribed antibiotics.

The proportion of inpatients on antibiotics having had a microbiological test varied widely from 5-10% in one hospital up to 50-100% in another. Commonly used antibiotics included penicillins +/- beta-lactamase inhibitors, macrolides and cephalosporins. There was considerable variation between hospitals in Defined Daily Doses (DDDs) of antibiotics per 100 bed days. This statistic had fallen over time in some hospitals and increased in others. The prevalence of antibiotic resistance increased in many of the bacteria tested between 2002 and 2004; for example in one hospital the percentage of *Strep pneumoniae* isolates with intermediate resistance to beta-lactams had increased from 22 to 33% for penicillin, from 7 to 25% for cefaclor and from 7 to 26% for a 3rd generation cephalosporin. This increase in resistance was greater in some cities than others (e.g. Guangzhou > Shanghai > Beijing).

Workshop participants noted that some resistance data presented appeared erroneous; it was agreed that microbiological testing needed to be performed by standard methods and carefully quality controlled. Ultimately, the aim of this ongoing study is to use this information to implement interventions to control antibiotic use and decrease antibiotic resistance in the paediatric setting.

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There was anecdotal evidence that injectable antibiotics are over-used in China (as in many other countries) for reasons including their increased profitability compared with oral agents as well as demand from patients.

Antibiotic use in rural areas of China

A report was presented from the Tongji University on a pilot project aimed at improving the use and controlling the costs of medicines in rural areas of China. The main problems described were the high use of antibiotics and hormones, excessive numbers of injections and the large proportion of clinic income derived from medicine sales. Interventions included strengthening management systems at three levels of health services (county hospital, commune hospital and village clinic), standardisation of pharmaceutical purchasing systems, increasing medical service charges and decreasing the charges for drugs, and promotion of rational use of medicines. The interventions resulted in a reduction of average prescription cost, average number of items on a prescription and prescribing of hormones. This research noted poor knowledge of medicines amongst rural doctors and patients. Proposals for the next phase of the project include the implementation of a formulary and treatment guidelines, further staff training, examination of incentives to encourage adoption of the new measures in all counties included in the project, and education of consumers.

Self medication and over-the-counter (OTC) antibiotic use

The workshop organisers were unable to find any researchers who could present work in this important area. Participants agreed that little is known about antibiotics purchased from retail pharmacies or community drug sellers. The recent introduction of legislation to ban OTC availability of a large number of antibiotics in China was regarded with some scepticism by workshop delegates.

National surveillance of antibiotic resistance and antibiotic use

A preliminary literature survey of papers dealing with antibiotic resistance in China, published from 1995-2004 was presented. The number of papers published had increased over time; especially since 2000. Most reports came from tertiary hospitals in the economically developed eastern coastal area. Data was presented on the classification of papers, the organisms studied and the hospitals and units from which they were collected. However, data on resistance patterns of particular organisms had not yet been analysed. Problems had been identified in many studies with both laboratory methodology and quality assurance.

An overview was provided of two national surveillance systems recently introduced by the Chinese Ministry of Health; one to monitor use of antibiotics in 20 hospitals and another to monitor antimicrobial resistance patterns in 17 hospitals around the country. It is also planned to increase the number of hospitals involved. Data is currently being collected and definitive results were not yet available. However, bacteria which appear problematic include methicillin-resistant *Staph aureus* (MRSA), penicillin-intermediate *Strep pneumoniae*, multi-resistant *E coli* and some vancomycin-resistant enterococci (VRE). A number of difficulties have been encountered in these programs. These included the extra burden that data collection caused already over-worked staff, the fact that the DDDs were not available for some of the newer drugs prescribed in China and that DDDs (which used adult dosing) were not necessarily appropriate for children. It was suggested that improvements to the study could be made by increased training and education of staff, better laboratory quality control systems, standardisation of surveillance methods, better systems to store and analyse large amounts of data, and international communication and collaboration.

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The Chinese Centre for Disease Control and Prevention (CDC) has recently commenced disease surveillance for 15 important communicable diseases, including typhoid fever, cholera, schistosomiasis, malaria, leptospirosis, brucellosis and plague. The CDC is also doing research on the mechanisms of antimicrobial resistance and has been involved in establishing a national training course on antimicrobial resistance surveillance.

During the discussion, it was emphasised that it is important to separate (&/or prioritise) reports of antibiotic resistance for particular microorganisms from different sites from which isolates are obtained; for example bacterial isolates from blood culture and cerebrospinal fluid are more likely to represent significant pathogens than isolates from sputum or ulcers. In addition, it is important to separate reports by different areas of the hospital; for example Burns or ICU wards will have a higher rate of resistant organisms compared with other wards and out-patients. If all results are combined there will be a bias towards reporting greater levels of resistance, which may encourage inappropriate use of antibiotics.

Clinical guidelines

In 2004, the Chinese Ministry of Health published “*Principles of Clinical Antimicrobial Use Guidelines*”. The document was developed by the Chinese Medical Association, the Chinese Pharmacy Association and the Pharmaceutical Committee of the Chinese Hospital Management Association with input from hundreds of specialists in various fields. The guidelines include information on general principles, bacteria, diseases and selection of antimicrobial agent. Antibiotics are classified as non-limited, limited and special use, which can only be prescribed by senior hospital staff.

While this was generally regarded as an excellent initiative it was not clear how well this document had been disseminated throughout China nor whether resources were available to assist implementation, e.g. by providing hospital Drug & Therapeutics Committees with financial grants to promote the “*Guidelines*” and compare what is being prescribed in their institutions with “*Guideline*” recommendations. In the light of the perverse funding incentives noted above there was some scepticism about the impact of these “*Guidelines*”.

In 2000, the Chinese Society of Paediatrics published guidelines for the rational use of antibiotics in acute respiratory tract infections in children; these are currently being reviewed and updated. It was not clear how the revised Paediatric Guidelines would differ from those produced by the Chinese Ministry of Health. In addition, it was reported that the latest Australian Therapeutic Guidelines are also being translated into Chinese (as was an earlier edition of the Australian Antibiotic Guidelines). These separate initiatives raised the question of whether it might be more efficient (and more sustainable) if they could be combined.

Australian initiatives in pharmaceutical policy and rational drug use

Speakers from Australia presented information on programs to ensure equitable access to medicines and programs promoting rational drug use in Australia.

The Pharmaceutical Benefits Scheme: ensuring equitable access to necessary medicines for rich and poor

In the late 1940s a valuable new drug, penicillin, became available that not all Australians could afford. This led to the establishment of the Australian Pharmaceutical Benefits Scheme (PBS) which initially provided a limited list of 137 “life-saving and disease preventing drugs” available to

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all Australians free-of-charge (paid for by taxation). Over the years, the cost of the PBS rose and various policy measures were introduced as a result. These included patient co-payments, the use of monopsony (national) buying power to counter the monopoly power that pharmaceutical companies enjoy during patent protection, reference pricing (subsidising only the lowest price product in a generic group and in some therapeutic classes) and pharmacoeconomic analysis (paying only what the health benefits of a drug are worth). The international pharmaceutical industry had problems with many of these initiatives culminating in public controversy over the recent Australia-US Free Trade Agreement. The US accused Australia of not paying its fair share of pharmaceutical research and development. They wanted the PBS modified to give US research-based manufacturers higher drug prices. While Australian negotiators agreed to minor modifications, they refused significant concessions. Currently, given the escalating cost of the PBS and an ageing and increasingly inactive and obese Australian population, the demand side of the PBS needs better control by more preventative health campaigns and public education. In addition, the supply side must continue to be moderated by ensuring that cost-effectiveness remains the criteria for PBS subsidy. The challenge is to maintain a balance between competing goals of Australian medicinal drug policy; especially ensuring that consumers have equitable access to affordable drugs and that the pharmaceutical industry remains profitable, research-based and export orientated.

The Pharmaceutical Benefits Scheme: working with the prescriber, pharmacy and patient to encourage compliance

Medicare Australia is a government agency that plays an integral role in the Australian health sector. Part of its role is to administer and manage payments for medical services and medicines subsidised by the government. Medicare Australia has a connection with every Australian resident, every doctor and every pharmacy, processing more than 400 million transactions a year and paying benefits to the value of around \$AU 16 billion a year. This presentation focused on Medicare Australia's work with prescribers, pharmacy and patients to ensure that the PBS is being used appropriately. In recent years, PBS expenditure has increased at rates faster than general health expenditure. Drivers for this growth include the introduction of new, higher cost medicines and increasing consumer expectations around the availability of these as subsidised medicines. To ensure that payments of benefits are correctly made for PBS services, Medicare Australia uses a range of strategies to prevent, detect, and investigate inappropriate use. These include a combination of: research, analysis of data, audits, direct interventions, and education and communication activities to inform and encourage appropriate use as required by the law that governs the use of subsidised medicines.

Therapeutic guidelines and quality use of medicines policy

In the late 1970s there was concern in Melbourne teaching hospitals about an increasing incidence of antibiotic-resistant microorganisms. In addition, drug utilisation studies had shown inappropriate antibiotic prescribing. This led to the establishment of a Victorian State working party charged with producing best-practice antibiotic guidelines. Mere distribution of the guidelines had little impact on prescribing habits. However, antibiotic prescribing improved when drug audits compared what was prescribed to what was recommended, and then fed back the discrepancies to clinicians, augmented by targeted education campaigns. These initiatives were ultimately incorporated in Australian Quality Use of Medicines Policy. In addition, a National Prescribing Service was established to continue educational interventions on a national basis. Therapeutic Guidelines now cover all major therapeutic areas. They are produced, marketed and sold by Therapeutic Guidelines Limited, an independent, not-for-profit enterprise that regularly distils best-practice prescribing guidelines for Australian health professionals. The Antibiotic title remains the flagship of Therapeutic Guidelines Limited with sales, surveys and endorsements over 12 editions attesting to

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its wide acceptance and use. While *Therapeutic Guidelines: Antibiotic* is only one of many initiatives that have contributed to improving antibiotic use in Australia, it has proved a valuable foundation on which to build other strategies. Currently, the increasing use of computerised prescribing in Australia has focused research on the need to integrate electronic guidelines with decision support software.

National Prescribing Service

The National Prescribing Service is a not-for-profit organisation funded by the Australian Government, to improve health through Quality Use of Medicines (judicious, appropriate, safe and effective use of drugs). Antibiotics are subsidised by the Australian government in primary care and in hospitals through the state health system. Doctors may prescribe for human use only and dispensing is restricted to registered pharmacists. Some prescribing is restricted to limited indications either by the subsidy scheme or policy within hospitals. Appropriate use of antibiotics has been a targeted program for NPS continuously since 1999. The primary aim of the program has been to reduce total antibiotic use in the community, to decrease use for upper respiratory tract infections and bronchitis and improve selection of the agents used in accordance with guidelines and current evidence. These objectives should minimise selection pressure for antibiotic resistance. Minor programs have also addressed skin and urinary tract infections. Interventions aimed at health professionals have targeted all 20000 general practitioners and 18000 pharmacists in Australia. Interventions include printed educational newsletters, prescriber feedback, self-audit with feedback, case scenarios, academic detailing and patient education materials. A parallel consumer awareness program has been used since 2001 to influence consumer expectations for antibiotic use in respiratory infections. A smaller project in 37 hospitals has aimed to improve antibiotic use in community acquired pneumonia in emergency departments, in accordance with Therapeutic Guidelines. Drug use evaluation cycles have been used to feed back usage patterns to all levels of prescribers and key nursing personnel. To improve understanding of appropriate prescribing by medical students a web-based curriculum to teach WHO Principles of Good Prescribing is provided to medical schools. Antibiotic use is addressed in two modules. Evaluation has shown decreased total use of antibiotics and improved selection in primary care, better concordance with guidance in treatment of community acquired pneumonia and better understanding by consumers of the limited role of antibiotics.

Small group sessions

Topic 1: Barriers to the rational use of antibiotics

Whilst there have been recent initiatives to promote rational use of antibiotics in China, workshop participants raised a number of issues which they believed to be barriers to the rational use of antibiotics (rational use means that antibiotics are used only when necessary, that the narrowest spectrum antibiotic is chosen for the likely infecting organism(s), that the lowest cost drug is selected if more than one alternative is available, and the dosage regimen and duration of therapy is adequate but not excessive).

Funding issues

Government funding covers only 5%-15% of Chinese hospital (and other health services) operational costs and health services therefore rely heavily on revenue raised from the sale of drugs and certain procedures and tests. There is great pressure on hospital directors to maintain hospital income. Profits from drug sales usually constitute around half of a hospital's income, with antibiotics accounting for about half of drug sales. Any decrease in the total use of antibiotics, or

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encouraging prescribing of narrower spectrum (and more cost-effective) antibiotics, will directly oppose the administrative goal of maximising revenue. Similarly, doctors' basic salaries are low and a doctor's income consists of salary plus bonuses based on generation of hospital income. Thus a reduction in antibiotic prescribing will also impact on the doctor's income – a major disincentive to rational prescribing.

Litigation (encourages defensive prescribing)

Litigation and violence against doctors and hospitals is increasing in China. When the legal judgement is in favour of the patient the hospital pays most of the cost of compensation, however a proportion must also be paid by the doctor. It was reported that some hospitals obtain medicolegal insurance for their employees however not all doctors are covered and cover is not always comprehensive. Fear of litigation encourages prescribing of newer and more powerful broad spectrum antibiotics to cover all possibilities rather than older narrower spectrum agents.

Patient demand

Strong patient demand for antibiotics - which are seen as a "cure-all" - places pressure on doctors to prescribe them. Patients reportedly prefer the more expensive antibiotics and intravenous administration as these are perceived as being more effective and more able to rapidly cure a wide range of symptoms including inflammation as well as infection. In general there is a lack of understanding by consumers of the role of antibiotics (and antiviral drugs), particularly in the treatment of upper respiratory tract infections.

Role of the pharmaceutical industry

As occurs in many countries, there are conflicting interests for the government between support for the pharmaceutical industry (which brings in investment and provides employment) and promotion of rational drug use in the health system.

The ways in which the pharmaceutical industry adversely influence drug use include increased production of newer more profitable drugs (with decreased or ceased production of older, less costly drugs) and direct to consumer advertising (this is illegal but continues to occur in some places). Pharmaceutical company representatives influence prescribers by providing biased information and gifts and commissions (the latter is however illegal). It was reported that drug company representatives target junior doctors and medical students and try to get around the rules and regulations which limit their access to hospital staff.

Clinical guidelines issues

Whilst it was acknowledged that the newly produced national clinical antibiotic guidelines (and other specialised guidelines) were an excellent initiative, a number of limitations of such guidelines were discussed. There was debate about applicability of the *Principles of Clinical Antimicrobial Use Guidelines* in different types of hospitals (large urban versus smaller rural hospitals) and it was suggested there was a need for local adaptation in different settings.

Clinical guidelines may lack diagnostic and other practical information which would be helpful for doctors and, as well as information on what should be done, they should also include information about what *not* to do. Prescribing by brand name is very common in China and the use of generic drug names only can cause confusion for doctors (this applies to guidelines, formularies, prescriptions etc).

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The extent of dissemination and awareness of guidelines across all levels of prescribers was unknown.

Drug committees and hospital formularies

Drug & Therapeutics Committees (DTCs) and pharmaceutical formularies can play a significant role in promoting rational drug use in hospitals. In China it appears that these are not being utilised well. Although hospitals have drug committees, their role is often limited to making decisions about drug purchasing, that is they are a “drug committee” only and most provide little guidance on therapeutic issues. The role and existence of pharmaceutical formularies in hospitals in China also appeared to be variable; some formularies contained numerous brands of a single generic, others only one or two.

Availability of drug information

Sources of drug information for doctors include the pharmaceutical industry, pharmacology textbooks and the hospital formulary. Drug information provided by the pharmaceutical industry was generally regarded as not objective and unlikely to encourage appropriate use of antibiotics.

The role of hospital pharmacists and pharmacy-run drug information centres in providing drug information (as is common in many countries) appears to be very limited in China. This is due at least in part to a lack of relevant clinical knowledge amongst pharmacists, and the fact that pharmacists are engaged in dispensing large numbers of prescriptions each day and so have limited time to provide other services.

OTC antibiotics

Many medicines in China are sold through retail pharmacies or drug outlets. These are frequently staffed by poorly trained drug sellers rather than properly trained pharmacists. It is likely that there is a high rate of inappropriate sale and use of antibiotics through these channels.

In the past most antibiotics were able to be purchased without a prescription, and there is a strongly ingrained culture in the community regarding the right to have ready access to antibiotics and the desire to store antibiotics in the home. The recent introduction of regulations requiring a prescription for most antibiotics was reported not to be working well. In some cases the regulations are disregarded by drug sellers, and the large number of retail outlets makes it extremely difficult to police and enforce the regulations. In addition, it was reported that some pharmacies may employ a doctor solely for writing prescriptions requested by patients (and these doctor do not take histories or examine the patient, they merely “legitimate” the prescription requested).

No studies examining use of antibiotics OTC were reported, so the volume and range of antibiotics and indications for which they are used is unknown.

Diagnostic issues and use of microbiological testing

Diagnosis of infections may be difficult due to time pressures &/or lack of access to microbiological testing. Doctors can see very large numbers of patients in some clinics, for example it was reported that at the Beijing Children’s Hospital 6000 outpatients are seen daily with each doctor seeing up to 100 patients per day. Thus, microbiological culture and sensitivity testing is frequently not performed. Laboratory facilities are not available in all hospitals (especially smaller

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hospitals) and concerns were also expressed regarding the accuracy and reliability of results from some labs.

Quality of medicines and counterfeit drugs

The quality of medicines and counterfeit drugs were not discussed in detail; however it is known that there are problems regarding the manufacturing quality of some medicines and a counterfeit drug industry is active in China. Counterfeit medicines are thought to be a problem particularly in rural areas. The use of sub-optimal doses as a result of poorly-manufactured antibiotics further contributes to antibiotic resistance.

Topic 2: Equitable access to antibiotics (and all drugs)

Health Insurance coverage

There is no universal health insurance system in China although the government is attempting to introduce new urban and rural health insurance schemes. Currently over 60% of Chinese citizens are not covered by health insurance, with the proportion higher in rural areas. Studies have shown that many people cannot afford to see a doctor or go to hospital when needed, and others are driven into poverty by health care costs. There is no system for cross subsidy from rich to poor, and those who least can afford it must pay for the full cost of their health care. (One of the many consequences of this situation is that people buy small quantities of OTC antibiotics, for example enough for 1 to 2 days only; this is likely to increase the prevalence of antibiotic resistance.)

In hospitals, doctors' prescribing of antibiotics may be influenced by the patient's level of insurance (&/or income), with selection of drug/s which are covered by the insurance fund or which are less costly for patients on a low income (Note: this depends on the doctor's access to information on drug prices).

Pharmaceutical pricing

Workshop delegates reported that drug pricing policy is not transparent and is not well understood by health workers. It was reported that while many drug prices are set by the government, others are set by the market. There is a lack of communication between government officials and health workers and no forum to discuss issues such as drug pricing policies. The relationship and agreements between pharmaceutical companies and local or central government agencies are also known to influence drug pricing; such relationships are not transparent.

“Guanxi”

Guanxi (“personal connections”) plays a role in many aspects of life in China, including provision of health services. Patients with connections in the health system may receive different treatment from those without such connections.

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Topic 3: An Action Plan to Further Improve Antibiotic Use in China

Health system funding

It was acknowledged that the government now recognises that the market-based approach to health care adopted in the 1980s is not functioning well and it is taking steps to address this. There are a number of pilot studies underway, for example experimentation with different types of insurance schemes, alternative pharmaceutical purchasing and funding arrangements, and discussion about setting up hospitals to provide basic medical services for those who cannot afford health care.

Participants believed the government needs to take a stronger role in health system financing, both directly and indirectly through insurance funds. One of the stated principles of the government is “to maintain the stability and harmony of the whole society” and it is in the interests of government to support rational drug use so that they may keep the population happy by ensuring that they have access to appropriate and affordable medicines. This is especially important if the government is funding insurance schemes which pay for medicines.

Participants argued that government-run hospitals and health services should be fully funded, which would enable promotion of rational, cost-effective services (including drug use), in contrast to the current system of perverse incentives to raise revenue by excessive and inappropriate drug use. It was noted that publicly funded health services (compared to private services) were the most cost-effective way of providing equitable health care.

Considerable interest was shown in the Australian Pharmaceutical Benefits Scheme & Medicare system and it was suggested that there might be benefit in appropriate Chinese officials visiting Australia to study these insurance systems in more detail. A similar study tour was recently undertaken by a delegation from the Thai National Health Security Office (NHSO).

Education of health professionals and the public

It was agreed that it is important to start rational drug use education in medical school and reinforce at regular intervals thereafter. There was interest in the internet-based Australian NPS national curriculum promoting better prescribing (based on the WHO Guide to Good Prescribing) used in all Australian medical schools and highlighting the use of the Australian National Formulary and Therapeutic Guidelines. In addition, there was interest in the continuing education activities of the Australian National Prescribing Service.

It was thought possible that similar activities could be supported by the Chinese Ministry of Health in association with other bodies. Education regarding appropriate use of antibiotics could be incorporated as an extension of the recent activities including the production of clinical guidelines, establishment of an antibiotic resistance surveillance network and evaluation of antibiotic use in a network of hospitals. The Ministry of Health website is accessible to many health workers and it was suggested as a portal from which to disseminate detailed and practical education on a range of therapeutic topics.

Clinical guidelines are potentially very valuable in promoting and auditing rational drug use but appropriate strategies (and resources) are required for their dissemination, implementation and evaluation. Drug audit - comparing what is prescribed against what the guidelines recommend for particular conditions - is a crucial strategy but will require capacity building in China. Feedback from users (particularly about problems with the guidelines) is also important so that when guidelines are reviewed and updated they can be improved with each new version. It was agreed

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that the sustainability of Chinese guideline production would be enhanced if linkages were established between the Australian and Chinese groups involved and unnecessary duplication of effort was eliminated.

Whilst a national program of consumer education is desirable, delegates suggested that in China health promotion programs at the local government or hospital level may be more feasible in the first instance. They felt it was important to get the messages out to the many millions of “common people”. Advertising about the appropriate use of antibiotics could be undertaken by local government departments, for example in local newspapers or television stations. Hospital education departments may be able to produce posters and brochures about appropriate use of medicines, in the same way that brochures are produced for example for diabetic patients. Local level activities could be supported by the education unit in the Ministry of Health, for example by production of educational materials at the central level which could be adapted to suit local needs.

It was pleasing that representatives from the Chinese Consumers Association (CCA) attended the workshop and it was agreed that co-operation between the CCA and medical staff attending the workshop would assist public education through co-authoring appropriate articles in CCA publications.

In Australia it has been found that education is most effective when health professionals are educated before consumers, so that when consumers are educated they will hear the same messages from doctors, the media, brochures etc. Once again, co-operation between Australian agencies such as the National Prescribing Service could be beneficial for Chinese agencies undertaking antibiotic education while short-term placement of staff in each others' organisations would assist capacity building.

Strengthening hospital drug committees and formularies

China has an Essential Drugs List which includes 2033 products including 1260 Chinese proprietary medicines and 773 chemical and biological products. Each city has its own list of drugs purchased locally. Within a region or hospital, active Drug & Therapeutics Committees (DTCs) with appropriate administrative authority can help to ensure that suitable drugs are selected for inclusion in the local formulary, implement formulary restrictions, provide guidance on good prescribing and can monitor drug usage. The role of DTCs in Chinese hospitals has the considerable potential to be strengthened and expanded. The WHO Manual, “*Drug and Therapeutics Committees - A Practical Guide*” is a valuable resource in this regard and it was noted that this manual is currently being translated into Chinese for launch in early 2006. This would be an opportune time for a Chinese national workshop on DTCs and related issues. In addition, workshop participants were enthusiastic for further cooperation with Australian institutions to provide training in this area.

OTC antibiotics

Given the paucity of available information, research on the current situation regarding OTC availability of antibiotics was suggested. This could be carried out as a project by Chinese pharmacy students if an interested university pharmacy department could be identified. The data could be provided to government to provide evidence of the effectiveness (or otherwise) of the new regulations regarding antibiotic availability in the community. Protocols for such studies are available from Australian workshop participants.

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It would also be of interest to find out more about the existence/role of professional organisations for community pharmacists, and whether they may have a role in influencing the availability of OTC antibiotics.

Pharmaceutical industry

It was agreed that pharmaceutical companies are part of the problem (of inappropriate drug use) but that they can also be part of the solution. They are major stakeholders in pharmaceutical policies and it is important to include representatives from the industry in policy discussions and at rational drug use conferences. Appropriate promotion of their products can be encouraged by industry Codes of Conduct while medical students and doctors also need to be reminded of the need for their own ethical conduct in their relationship to the pharmaceutical industry. Medical and pharmacy student projects can be helpful in critiquing pharmaceutical promotion, discussing ethical issues and can report breaches to State or national authorities.

Drug pricing

A review of the pharmaceutical pricing system in China compared with other countries was recommended. The current Chinese system is complex, many government departments appear to be involved; it is not transparent and it causes considerable confusion amongst health professionals. An understanding of pricing policy and ready access to information on the price of drugs will assist doctors (and pharmacists) in making rational drug selection and prescribing choices. This study would require health economists with a good knowledge of international pharmaceutical pricing systems.

It was noted that prices of antibiotics (and other goods and services) are available to the public in some hospitals, enabling consumers to recognise more expensive antibiotics and other drugs. It would be helpful to understand the effects of publishing prices on prescriber and consumer behaviour.

Litigation

There is limited medicolegal insurance to protect doctors who are sued. It was commented that in some countries there is a no fault compensation system, where patients cannot sue doctors directly but may receive compensation from a government insurance scheme in cases of medical misadventure. It was also noted that prescribing in line with national, up-to-date, best-practice clinical guidelines provided good protection for doctors in cases of litigation in Australia.

Workshop recommendations

1. The Chinese MoH needs to change the present perverse funding system which requires hospitals and health services to encourage excessive and inappropriate prescribing in order to remain financially viable.
2. Appropriate Chinese officials could benefit from undertaking a study tour of the Australian Pharmaceutical Benefits Scheme & MEDICARE system.
3. The recently published Chinese, “Principles of Clinical Antimicrobial Use Guidelines” needs to be supported by a dissemination and implementation strategy. This will require setting up a rational drug use (RDU) coordinating unit and appropriate funding from the local sources &/or donors. Roles suggested for the RDU coordinating unit include:
 - 3.1. Supporting hospitals involved in the current MoH surveillance of antibiotic use and antibiotic resistance to extend this work to include antibiotic audits (comparing what is

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- prescribed in certain areas with guideline recommendations), targeted education campaigns to correct problems identified and campaign evaluation;
- 3.2. Linking with international counter-parts such as the Australian National Prescribing Service in order to increase local capacity in supporting, running and evaluating RDU campaigns;
 - 3.3. Coordinating and supporting local groups involved in antibiotic guideline production in order to reduce duplication of effort and make the process more sustainable;
 - 3.4. Linking with international groups such as the Australian Therapeutic Guidelines project to assist keeping antibiotic guidelines up-to-date as well as extending the project to other therapeutic areas;
 - 3.5. Translating and localising the WHO, "Guide to good prescribing" into Chinese and making this available to all medical schools, perhaps via the MoH web site;
 - 3.6. Commissioning research by academic departments (clinical pharmacology, pharmacy, paediatrics, public health, etc), perhaps in association with international colleagues experienced in this area, in areas such as:
 - 3.6.1. OTC antibiotic use;
 - 3.6.2. Pharmaceutical industry promotional practices and Codes of Conduct;
 - 3.6.3. Drug pricing in China compared to other countries.
4. Chinese DTCs need to be strengthened by:
 - 4.1. Using the planned 2006 launch of the Chinese translation of the WHO Manual, "Drug and Therapeutics Committees - A Practical Guide" to run a national workshop on DTCs with a special focus on improving antibiotic use;
 - 4.2. Linking key hospital DTCs with international counterparts in order to exchange personnel, train trainers and build capacity.
 5. The Chinese Consumers Association (CCA) and the Chinese Paediatric Society should co-author appropriate articles in CCA publications to assist public education about appropriate antibiotic use.

Conclusion

Clearly much progress has been made since the first antibiotic workshop was conducted in China in 1994. Nevertheless, many challenges remain. Further data about increasing antibiotic resistance and inappropriate antibiotic use have led to concerns about privatisation of the Chinese health care system, the need for hospital funding reform and the requirement for a more comprehensive medicinal drug policy that better ensures equitable access to necessary drugs for all, both rich and poor. If this journey is to progress there is a need for more people - consumers, clinicians, pharmacists, academics, administrators and the pharmaceutical industry to share these goals, come on board and progress the work. Finally, this workshop demonstrated the value of international cooperation because all countries face the same problems and all can learn from each other.

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References

Chinese Health and Pharmaceutical System

Blumenthal D, Hsiao W. Privatization and its discontents - The evolving Chinese health care system. *N Engl J Med* 2005; 353(11):1165-70. (15 September 2005).

<http://content.nejm.org/cgi/content/full/353/11/1165>

Goodman PS. Hospitals in China find Profit in Aids. *Washington Post, Foreign Service*, 8 November 2005.

<http://www.washingtonpost.com/wp-dyn/content/article/2005/11/07/AR2005110701671.html>

Lin Dan. Unexpectedly high hospital bills questioned. *China Daily*, 24 November 2005.

http://www.chinadaily.com.cn/english/doc/2005-11/24/content_497657.htm

Xinhua News Agency. China to slash prices of antibiotics. *People's Daily Online [English]*, 1 June 2004. http://english.people.com.cn/200406/01/eng20040601_144964.html

Xinhua News Agency. First guideline on clinical use of antibiotics issued. *China through a lens [English]*, 10 October 2004. <http://www.china.org.cn/english/2004/Oct/108983.htm>

Goodman PS. China's Killer Headache: Fake Pharmaceuticals. *Washington Post*, 30 August 2002.

<http://www.washingtonpost.com/ac2/wp-dyn/A13785-2002Aug29>

WHO Resources

WHO Report on Infectious Diseases, Overcoming Microbial Resistance

http://www.who.int/multimedia/antibiotic_res/index.html

WHO Global Strategy for Containment of Antimicrobial Resistance

<http://www.who.int/drugresistance/en/>

WHO Policy Perspectives on Medicines, The problem of antimicrobial resistance.

http://www.who.int/entity/medicines/publications/policyperspectives/ppm_10_en.pdf

WHO Policy Perspectives on Medicines, Promoting Rational Use of Medicines: Core Components 2002.

<http://www.who.int/entity/medicines/publications/policyperspectives/ppm05en.pdf>

WHO Guidelines on Hand Hygiene in Health Care: A Summary 2005.

http://www.who.int/patientsafety/events/05/HH_en.pdf

WHO Drug and Therapeutics Committees - A Practical Guide.

http://whqlibdoc.who.int/hq/2003/WHO_EDM_PAR_2004.1.pdf

WHO Introduction to Drug Utilisation Research WHO/2003 ISBN 82-8082-039-6.

<http://whqlibdoc.who.int/publications/2003/924156234X.pdf>

WHO DAP. How to Investigate Drug Use in Facilities: Selected drug use indicators WHO/DAP/1993.1.

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WHO Guide to Good Prescribing: A Practical Manual.

<http://www.med.uva.es/who/ggp/homepage.htm>

WHO Ethical criteria for medicinal drug promotion. Geneva: World Health Organization; 1988.

Other Useful Resources

Adopting best evidence in practice (National Institute of Clinical Studies). Med J Aust 2004; 180(6) (Supplement): S41-71.

http://www.mja.com.au/public/issues/180_06_150304/suppl_contents_150304.html

Antibiotic Writing Group. Therapeutic guidelines: Antibiotic. Melbourne: Therapeutic Guidelines Ltd, 2003. <http://www.tg.com.au>

Breen KJ. The medical profession and the pharmaceutical industry: when will we open our eyes? Med J Aust 2004; 180 (8): 409-410.

http://www.mja.com.au/public/issues/180_08_190404/bre10055_fm.html

Dartnell J. Activities to improve hospital prescribing. Aust Prescr 2001; 24:29-31.

<http://www.australianprescriber.com/magazine/24/2/29/31/>

Dartnell J. Understanding, influencing and evaluating drug use. 2001.

<http://www.tg.com.au/index.php?sectionid=79>

Harvey K, Dartnell J, Hemming M. Improving antibiotic use: 25 years of antibiotic guidelines and related initiatives. Commun Dis Intell 2003; 27 Suppl: S9-S11.

<http://www.cda.gov.au/pubs/cdi/2003/cdi27suppl/htm/cdi27supd.htm>

Harvey KJ, Vitry AI, Roughead E, et al. Pharmaceutical advertising in prescribing software: an analysis. Med J Aust 2005; 183: 75-79.

http://www.mja.com.au/public/issues/183_02_180705/har10263_fm.html

Komesaroff PA, Kerridge IH. Ethical issues concerning the relationships between medical practitioners and the pharmaceutical industry. Med J Aust 2002; 176 (3): 118-121.

http://www.mja.com.au/public/issues/176_03_040202/kom10098_fm.html

Medicines Australia. Code of Conduct Edition 14, 2003 and related reports.

http://www.medicinesaustralia.com.au/html/coc_full.asp

Maxwell DJ, McIntosh KA, Pulver LK, Easton KL for the CAPTION Study Group. Empiric management of community-acquired pneumonia in Australian emergency departments. Med J Aust; 183:520-524

http://www.mja.com.au/public/issues/183_10_211105/max10526_fm.html

Other Relevant Web Sites

Alliance for the Prudent Use of Antibiotics (APUA).

<http://www.tufts.edu/med/apua/>

Australia's National Medicines Policy

<http://www.health.gov.au/internet/wcms/publishing.nsf/Content/nmp-objectives-index.htm>

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Health Action International Asia Pacific (HAIAP).

<http://www.haiap.org/>

Healthy Skepticism (how to improve pharmaceutical promotion).

<http://healthyskepticism.org>

National Prescribing Service

www.nps.org.au (see health professional section - antibiotics and consumer section - common colds need common sense). Resources for the CAPTION project are available by contacting Judith Mackson: jmackson@nps.org.au

National Prescribing Service National Curriculum: Promoting Better Prescribing.

<http://nps.unisa.edu.au/new/index.htm>

Reaction on antibiotic resistance (REACT).

<http://www.reactgroup.org/>

WHO Drug Promotion Database.

<http://www.drugpromo.info/>