Commentary

Internet pharmacy: a web of mistrust?

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Traditional models of access to medicines are under threat. For decades, to obtain the newest and most powerful medicines patients have needed a prescription, usually written by a doctor after consideration of a differential diagnosis at a face-to-face consultation, which is subsequently dispensed after presentation at a pharmacy (Figure 1). Each 'prescription-only medicine' (POM) available in this way has been carefully considered by regulatory authorities prior to granting of marketing authorization for specified prescribing indications. The availability of POMs is now limited further in some health services by the emergence of government agencies, such as the National Institute of Clinical Excellence in the UK, that restrict prescribing of medicines that are considered less cost-effective. In an information-rich age when patients expect (and have been promised [1]) greater empowerment, this tightly regulated, professionally led environment leaves some frustrated and disenfranchised, particularly if gaining access to the doctor is difficult (or costly). This barrier may be addressed, in part, by the emergence of new prescribing groups such as pharmacists and nurses [2] but, for most, free choice to self-medicate is limited to a small number of safer 'over-the-counter' medicines.

However, this carefully regulated system is being progressively bypassed by the boom in internet drug sales. The number of on-line pharmacies offering to sell POMs directly to consumers is growing rapidly, with annual sales from Canada alone estimated to be worth \$726 million in 2005 [3]. Medicines commonly accessed in this way include analgesics (e.g. oxycodone), anxiolytics and sedatives (e.g. diazepam), antidepressants (e.g. fluoxetine), stimulants (e.g. methylphenidate), anorectics (e.g. phentermine) and others that are generally considered as 'lifestyle drugs' (e.g. sildenafil for impotence, finasteride for hair loss). Although some internet pharmacies may offer medical support ('cyber doctors') or apply a diagnostic questionnaire to gauge suitability, many will sell drugs, some of which are controlled or high risk, without a prescription and without requiring a visit to a doctor [4]. POMs available in this way are accessed by approximately 4% of US adults [5].

Various motivations may persuade members of the public to purchase POMs via the internet, in most instances discarding the involvement of skilled healthcare professionals. Convenience is a key factor, particularly for those who are disabled or housebound, who can order medicines from their own home in unlimited quantity 24 h a day. Another is cost. Internet pharmacies often make branded or generic POMs available more cheaply. This underlies the phenomenal growth of Canadian sites selling to consumers forced to pay higher prices through the US market [3]. The internet sales model reduces overheads and provides a level of competition that cannot be matched by 'bricks and mortar' pharmacies. On-line pharmacies can also provide immediate access to a plethora of additional product information via hyperlinks and search programs. Some patients may have found it impossible to find a doctor willing to prescribe or able to prescribe the medicines they wish to take. Desperation may be a factor for those with serious or debilitating conditions (e.g. cancer [6]), where the best available healthcare has failed to match expectations. A final benefit for some is privacy, particularly valued for some lifestyle conditions that are a source of embarrassment or shunned by the medical establishments [7].

Other important trends have supported the growth of internet sales. There may be an increasing perception that prescription drugs, which carry the stamp of regulatory approval, are safe and constitute little more than another consumer item. This notion could be reinforced by the growing acceptance and prescription of analgesics and mood-stabilizing drugs and, in some countries, by widespread exposure to direct-to-consumer advertising [8]. The progressive affirmation of patient autonomy and empowerment in modern healthcare may have encouraged self-diagnosis and a willingness to procure the treatments thought necessary.

Although on-line sales by legitimate providers, run on a sound professional basis, may undoubtedly provide benefits, serious concerns have emerged about the overall impact of the internet pharmacy sector on public health. Many less reputable sites are openly engaged in illegal

Figure 1

Access to prescription-only medicines

on-line trafficking of controlled drugs, which are now available unrestricted, even to the young. There is now a cyber-market for illegal distribution of drugs that are either unapproved by regulatory authorities, dispensed without a valid prescription, illegal versions of prescription drugs (some ineffective, out of date or contaminated), marketed with fraudulent health claims, or intended for recreational or criminal use [e.g. gamma hydroxybutyrate (GHB) used for body building and incapacitating victims of 'date rape']. Not surprisingly, misuse of POMs is accounting for an increasing proportion of US emergency room visits [9], and there have also been numerous reports of serious adverse events or interactions following internet purchases [10]. Many sites also lack the most basic e-commerce security features, thus putting personal information at risk.

Internet sales of POMs should now be recognized as a serious and growing public health issue that may ultimately pose a much greater threat to health than rofecoxib (Vioxx®) or any of the other recent medicines 'scandals'. We believe that urgent action is now required to tackle the worst excesses of this trade, but also to protect the benefits of legitimate on-line operations. This will require a combination of legislation review, law enforcement and public

education, each of which poses considerable challenges. There is a need to redefine, in the internet age, what constitutes a doctor-patient consultation, in what circumstances this can occur on-line and whether this can lead to a valid prescription (without which the supply of popular narcotics, sedatives, stimulants and anabolic steroids is already illegal in the UK and USA). Law enforcement agencies should take steps to block websites that breach these agreed basic professional standards. The ubiquitous nature of the internet requires a multinational approach to thwart the activities of those operating from countries where no relevant legal provisions are in place. There have already been some successes in enforcing current legislation [11], but we should recognize that the anonymity, ease of changing websites, use of multiple portals of access to anchor sites, and the potentially enormous profits to be made will mean that such measures are going to be only partially successful. It will clearly be important to bring together major stakeholders, including internet service providers, search engines, banks and credit agencies, and postal services as well as regulatory authorities.

As for so many public health issues, improved education and raised awareness of the hazards will be crucial.

Such information is already provided by the regulatory authorities in the UK and USA [12, 13], but is likely to be ineffective unless supported by campaigns through the media, internet search engines and service providers. These should highlight factors that suggest a less reputable site (e.g. failure to provide a physical address, lack of links to the national healthcare system, no requirement for a valid prescription, failure to ask for details about the patient or their doctor). Official approval of reputable businesses will also afford some protection for the unwary. Registration schemes for reputable businesses are already run by the Royal Pharmaceutical Society of Great Britain and the National Association of Boards of Pharmacy in the US and provide a model for the future [14, 15].

Competing interests

None to declare.

REFERENCES

- 1 Department of Health. Building on the Best: Choice, Responsiveness and Equity. London: Department of Health, 2003. Available at: <http://www.dh.gov.uk/en/Consultations/Responsestoconsultations/DH-4068391>.
- 2 Horton R. Nurse-prescribing in the UK: right but also wrong. *Lancet* 2002; 359: 1875–6.
- 3 Dube G. Competing for the retail drug market. Statistics Canada, September 2006. Available at <http://www.statcan.ca/english/research/11-621-MIE/11-621-MIE/11-621-MIE2006048.pdf> (last accessed: 9 May 2008).
- 4 The National Center on Addiction and Substance Abuse at Columbia University. 'You've Got Drugs!' Prescription Drug Pushers on the Internet. New York: National Center on Addiction and Drug Abuse at Columbia University, 2006. Available at <http://www.casacolumbia.org/absolutenm/articlefiles/380-YGD3%20Final%20Report.pdf> (last accessed: 9 May 2008).
- 5 Fox S. 'Prescription Drugs Online', Pew Internet & American Life Project. 2004. Available at <http://www.pewinternet.org> (last accessed: 9 May 2008).
- 6 Revill J. Cancer patients turn to internet for cheap drugs. *The Observer* 2006; November 5. Available at <http://www.guardian.co.uk/society/2006/nov/05/health.medicinelandhealth> (last accessed: 9 May 2008).
- 7 Flower R. Lifestyle drugs: pharmacology and the social agenda. *Trends Pharmacol Sci* 2004; 25: 182–5.
- 8 The direct-to-consumer advertising genie (Editorial). *Lancet* 2007; 369: 1.
- 9 Abuse D. Warning Network, 2005: National Estimates of Drug-Related Emergency Department Visits. Rockville, MD: US Department of Health and Human Services, 2005. Available at <http://dawninfo.samhsa.gov/files/DAWN-ED-2005-Web.pdf> (last accessed: 9 May 2008).
- 10 Wood DM, Dargan PI, Button J, Holt DW, Ovaska H, Ramsey J, Jones AL. Collapse, reported seizure – and an unexpected pill. *Lancet* 2007; 369: 1490.
- 11 Hubbard WK. Statement to the Committee on Government Reform, US House of Representatives Hearing on Internet Drug Sales. March 18, 2004. Available at <http://www.fda.gov/ola/2004/internetdrugs0318.html> (last accessed: 9 May 2008).
- 12 Medicines and Healthcare Regulatory Agency. Buying medicines over the Internet. Available at <http://www.mhra.gov.uk/Safetyinformation/Generalsafetyinformationandadvice/Adviceandinformationforconsumers/BuyingmedicinesovertheInternet/index.htm> (last accessed: 9 May 2008).
- 13 US Food and Drug Administration. Buying medicines and medical products online. Available at <http://www.fda.gov/buyonline/> (last accessed: 9 May 2008).
- 14 Royal Pharmaceutical Society of Great Britain. Internet pharmacies logo. Available at <http://www.rpsgb.org/registrationandsupport/registration/internetpharmacylogo.html> (last accessed: 9 May 2008).
- 15 National Association of Boards of Pharmacy. Verified Internet Pharmacy Practice Sites[™] (VIPPS[®]) Program. Available at <http://www.nabp.net/index.html?target=/vipps/consumer/fac.asp&> (last accessed: 9 May 2008).

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