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Lessons from international experience in controlling pharmaceutical expenditure. I: influencing patients

Nick Freemantle, Karen Bloor

This is the first of three papers to review international policies to control spending on drugs and improve the efficiency of drug use. Policies can target three main groups: patients, prescribing doctors, and the drugs industry. In this paper we examine policies aimed at patients, particularly restrictions on reimbursement (such as prescription charges). Rigorous experimental and quasi-experimental studies suggest that policies to limit the level of reimbursement of drugs reduce the use of essential as well as non-essential drugs and may do more harm than good.

Spending on drugs in the British NHS represents over 10% of the total NHS budget and has increased steadily over recent decades.^{1,2} Similar increases have occurred in health care systems throughout the developed world, and governments have adopted policies to control drug costs that affect both the supply of and demand for drugs. We reviewed recent policy in several developed countries to provide insights for British health policy. We assessed the impact of these policies on prescribing by examining evaluative studies with rigorous designs that we identified through a comprehensive search strategy.

In this paper we examine the impact of policies intended to reduce patient demand for drugs. In future papers we consider policies aimed directly at prescribers and policies intended to regulate the activities of the drugs industry.

Methods of review

Policies to control drug costs and to improve the cost effectiveness of drug use in the developed world are subject to frequent change. We used published descriptive studies and extensive contact with experts in relevant countries to ensure that our review was up to date and that policy initiatives were interpreted correctly. Where necessary, foreign language publications were translated to enable up to date analysis of policy.

In order to assess the impact of such policies in practice, and gaps in knowledge, we identified evaluative studies of policies in different countries that met predetermined explicit criteria on quality. Randomised studies provide the most valid and reliable estimates of the effectiveness of interventions in health services, but non-equivalent group designs with pre-post measures and interrupted time series designs may also provide reliable estimates of the impact of policy initiatives, enabling attribution of any effect to the intervention.^{3,4} We

made an iterative search of *Medline* and hand searches of *PharmacoEconomics*, *Health Economics*, and selected years of *Social Science and Medicine*, *Health Policy*, and *Scrip*. We also searched the *Cochrane Collaboration on Effective Professional Practice* register of studies—a database derived from electronic searches, hand searches, and contact with experts on the subject that contains evaluative studies which meet specific criteria.³

Policies for influencing patient demand

Various interventions are used to depress the demand for drugs by limiting reimbursement of products and providing an incentive for patients to reduce their consumption of drugs. Copayments require patients to pay a proportion of the cost of a prescribed product or a fixed charge (such as the British prescription charge). Patient caps limit the number of reimbursable prescriptions per patient. The withdrawal of reimbursement of a drug may also be used in attempts to reduce prescribing.

Several countries have copayment systems. In Britain the prescription charge covers about 40% of average prescription costs, but only about 12% of prescriptions are charged,² with exemptions for patients with specific chronic diseases or therapeutic categories, elderly people, and those on a very low income. By contrast, the American Medicare scheme, which provides health care for elderly people, reimburses only certain selected drugs (such as those for patients with end stage renal disease). Medicaid, which provides health care services for some of the poor in the United States, reimburses only drugs that are on the formulary in that state, and various restrictions limit the rate at which products are reimbursed.

The flat rate prescription charge applied in Britain (currently £5.25 per item) is less sophisticated than that applied in some other health systems. In countries with a reference price scheme, where a standard price is allocated to a group of drugs, copayments commonly include a fixed charge plus any difference between the actual price and the reference price. In Germany there is a fixed charge of DM3, DM5, or DM7 (£1.50-£3.50), based on the package size of a prescription item, plus any difference between the reference price and the retail price for drugs that are priced higher than the reference price for their group. In New Zealand and Sweden there is a fixed maximum prescription charge plus a premium for drugs costing more than the reference price.

In France copayments are based on the drug reimbursement rate (assessed by the transparency commission). Drugs for serious and chronic conditions and exceptionally expensive drugs are fully reimbursed. Other drugs are reimbursed at 65% or 35% for

Centre for Health Economics, University of York, York YO1 5DD
Nick Freemantle, research fellow

Department of Health Sciences and Clinical Evaluation, University of York, York YO1 5DD
Karen Bloor, research fellow

Correspondence to:
Ms Bloor.

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treatments for minor pain. About 10% of the population with health insurance are exempt from copayment, and many who are liable to charges are covered at least partially by supplementary health insurance.⁵

In Italy drugs for severe and chronic illness (class A) are fully reimbursed. Drugs deemed to be non-essential but potentially useful (class B) require 50% copayment, and other drugs (class C) are paid for by the patient. Exemptions include those for patients with chronic disease, elderly people, and children aged under 6, with some restrictions according to income. The categorisation of drugs such as fluoxetine and paroxetine as category B drugs despite companies agreeing to cut prices has led to some controversy.^{6,7} In Spain copayments are set at 40% of the sale price, with a lower payment of 19% for drugs for treating chronic and fatal diseases, a maximum annual charge, and some exemptions.

Caps on the number of drugs that may be reimbursed in a specified period have been applied in the United States. Several countries have removed products from lists of reimbursable drugs in attempts to contain costs.

Evidence from evaluative studies

COPAYMENT SCHEMES

Copayments have been shown to reduce use of drugs in a large non-equivalent group study with pre-post measures in the United States.⁸ At moderate user charges, however, the use of drugs defined as essential (including antihypertensive drugs and those for heart conditions, diabetes, and thyroid conditions) were also reduced substantially. In a series of quasi-experimental studies patient caps have been shown to reduce the number of prescriptions filled compared with a prior copayment system.⁹⁻¹¹ However, these studies also revealed an increase in related health care costs such as acute psychiatric services,⁹ institutionalisation in nursing homes for elderly people,¹⁰ or a substantial reduction in the use of essential drugs such as insulin, thiazides, or frusemide.¹¹ In this last study, restoring a copayment system returned prescriptions to near the level found before the reimbursement caps scheme.

The scheme seemed to have a substantial impact on certain particularly vulnerable patient groups. For example, limiting reimbursement to three drug prescriptions a month for patients with major psychiatric illness in New Hampshire was estimated to cost 17 times more than it saved.⁹ Caps resulted in substantial reductions in the use of psychotropic drugs, with coincident increases of one or two visits a month to community mental health centres and a sharp increase in the use of mental health services and hospitalisation. The authors concluded that limits on coverage for the costs of prescription drugs could increase the use of acute mental health services by low income patients with chronic mental illnesses and increase costs to the government, apart from the increased suffering of the patients.⁹

WITHDRAWING REIMBURSEMENT

The removal of a product from reimbursement may also lead to unexpected and unwanted outcomes. Withdrawing payment for drugs that do not meet criteria for efficacy or safety does not necessarily result in improved drug use overall. A rigorous study of the withdrawal of 12 categories of drugs with questionable efficacy in a random Medicaid sample showed that it resulted in an increase in prescriptions overall (due to substitutions), many of which were not desirable.¹² The voluntary withdrawal of a non-steroidal anti-inflammatory drug (zomepirac sodium) from the American market—because of rare allergic reactions—led to greater prescribing of potentially more dangerous drugs, including a 2.7% increase in the use of barbiturates.¹³ The authors concluded that “the sudden withdrawal of zomepirac... resulted in substitutions not only for other

non-steroidal anti-inflammatory drugs, but also of alternative analgesics that carry risks of habituation and adverse effects.” Policy makers advocating withdrawing reimbursement for drugs or subjecting them to high patient penalties should consider the potential impact on other prescribed drugs.

Do British patient charges modify demand for drugs?

None of the evaluative studies we found that met our entry criteria were undertaken in Britain, and the total number of British evaluations is small. However, the results consistently suggest that prescription charges may have substantial and perverse effects on patients' demand for drugs and use of health services. Several economic analyses have examined this issue. Lavers analysed data from the United Kingdom from 1971 to 1982 and concluded that prescriptions had been responsive to price, with a price elasticity of between -0.15 and -0.20.¹⁴ A 10% increase in the prescription charge could therefore lead to a 1.5-2% decrease in the demand for prescriptions. Ryan and Birch found that increasing NHS prescription charges were associated with a significant reduction in the use of prescribed drugs by patients who were not exempt during 1979-85.¹⁵

User charges have been described as “misguided and cynical attempts to tax the ill and/or drive up the total cost of health care while shifting some of the burden out of government budgets”^{16,17} and contrary to the aim of the NHS.¹⁸ When the charges were introduced it was hoped that patients would buy over the counter drugs costing less than the charge without bothering doctors.¹⁸ However, money was not saved as doctors increased the size of prescriptions (an increase in the prescription charge in 1961 was associated with an increase of 4% in the average quantities per prescription).¹⁹ Prescription charges may not adequately contain costs (due to the quantity of exemptions) or encourage equity and the efficient use of drugs. Rather than reduce “misuse” of health care services, charges may reduce both cost effective and inefficient drug use, encourage switching to less efficient services, and do more harm than good. In the light of the existing evidence, further increasing the prescription charges in the NHS may reduce government expenditure but not enhance the efficient use of drugs.

Further research is also required on the impact of prescription charges on over the counter drugs, but this is beyond the scope of this review. The experimental and quasi-experimental evaluative studies that we reviewed were large, well designed, and informative. They show that rigorous research is not limited to questions of clinical and cost effectiveness but may also examine policies intended to improve the efficiency of health services.

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Lesson of the Week

Delayed diagnosis of Kawasaki disease presenting with massive lymphadenopathy and airway obstruction

David Burgner, Marino Festa, David Isaacs

Kawasaki disease should be considered in any child with persistent fever as early treatment improves outcome

Kawasaki disease is an acute, self limiting febrile illness of infants and young children. In children under 5 years of age the incidence varies from about 3-6 per 100 000 in Europe¹ to 90 per 100 000 in Japan.² It causes coronary artery lesions in about 20% of untreated patients, up to 2% of whom die.³ Diagnosis is based on the presence of a prolonged fever (of more than five days duration) plus four of the following five signs: conjunctival injection, changes in the mucous membranes, changes in the peripheries (erythema of the palms and soles and swelling of the hands and feet), rash, and lymphadenopathy. The clinical features may be supplemented by non-specific laboratory investigations—for example, thrombocytosis and an increased erythrocyte sedimentation rate—but there is no specific diagnostic test. Prompt diagnosis permits early treatment with intravenous immunoglobulin, which reduces the incidence of coronary artery lesions by up to two thirds.^{4,5}

Lymphadenopathy is the least constant of the diagnostic features of Kawasaki disease, occurring in 50-75% of patients; the other clinical criteria occur in about 90%.³ We describe a case of Kawasaki disease in which massive lymphadenopathy was the overriding clinical feature, resulting in upper airway obstruction and delayed diagnosis.

Case report

A previously well and fully immunised 4 year old white boy presented with a 10 day history of sore throat and fever that was unresponsive to oral antibiotics. Two days earlier he had developed a painful swelling in the right side of his neck which continued to enlarge. Initial examination showed that he was feverish, with a painful torticollis. He had large red tonsils, and the right tonsil was displaced medially. There was a large (5 × 3 cm), tender, and erythematous swelling in the posterior triangle of the right side of the neck. His respiratory function was not compromised, and none of the other features of Kawasaki disease was evident.

An initial full blood count showed moderate leucocytosis ($16.4 \times 10^9/l$) and normal numbers of platelets. Cervical lymphadenitis was diagnosed and he was treated with intravenous ampicillin and flucloxacillin. Over the next 24 hours he remained unwell and feverish, and the cervical mass increased, with erythema and oedema spreading caudally to the chest wall. The antibiotic regimen was changed to cefotaxime, metronidazole, and penicillin to cover a possible polymicrobial fasciitis.

Respiratory embarrassment and increasing dysphagia necessitated intubation and ventilation. A fine needle

aspiration of the neck mass gave only scanty return, which was sterile on bacterial culture. A cervical computed tomogram showed no focal collection but pronounced lymphadenopathy (fig 1). On the third day of admission rash, palmar erythema, non-purulent conjunctivitis, palmar erythema, a scalded skin appearance of his buttocks, together with pronounced thrombocytosis ($537 \times 10^9/l$) and leucocytosis ($26.1 \times 10^9/l$) developed. Kawasaki disease was diagnosed clinically and he was given intravenous immunoglobulin (2 g/kg) and low dose aspirin (2 mg/kg). His fever immediately subsided. His initial echocardiogram was normal and he was extubated uneventfully. Three days later his palmar and groin rash desquamated. A repeat echocardiogram at six weeks was normal. An antistreptolysin O titre taken two weeks into his illness was negative (< 150 IU/ml: normal range < 200 IU/ml).

Comment

This child eventually fulfilled the diagnostic criteria for Kawasaki disease; the negative culture and antistreptolysin O titre made a diagnosis of streptococcal or staphylococcal lymphadenitis less likely. The presentation of Kawasaki disease with predominantly upper airway symptoms is rare but well recognised.

Fig 1—Transverse cervical computed tomogram showing pronounced lymphadenopathy and oedema.

Department of Microbiology, Royal Alexandra Hospital for Children, Westmead, NSW 2145, Australia
David Burgner, registrar

Department of Intensive Care, Royal Alexandra Hospital for Children
Marino Festa, registrar

Department of Immunology and Infectious Diseases, Royal Alexandra Hospital for Children
David Isaacs, head

Correspondence to: Dr Isaacs.

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