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Review

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Abstract

Rationing health services is an inseparable part of the health system of any country in order to achieve universal health coverage. Elective surgery for total hip and total knee replacement places a high financial burden on health systems. Such surgery should be done in a way to ensure that the people who most need it receive the service. Models for rationing total hip and knee replacement surgery were reviewed to suggest the best policy for rationing such surgery in the Islamic Republic of Iran. We propose a system with three main tools: clinical guidelines, gate keepers and waiting lists, with shared decision-making as an auxiliary tool. Patients should be scored at the primary health care level based on clinical and radiographic examination, alternative treatments (conservative treatments) and risk factors, with a set threshold for referral. Patients whose scores are above the threshold should be referred to secondary health care. These patients should be assessed again by specialists based on age, bone condition, surgery risk and other alternative treatments. Patients whose scores are above the threshold should be put on the waiting list for surgery.

Keywords: arthroplasty, replacement, knee, hip, elective surgery, health services, policy, Iran

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Introduction

Health costs have increased faster than global economic growth over the past 15 years (1), which is an important issue for health systems. Financial resources allocated to health services are generally inadequate, especially in developing countries . As a result these services have only a small effect on public health and tend to benefit rich people more (2). One of the solutions to this problem that the World Health Organization has promoted as a prerequisite for achieving universal health coverage is rationing (3). Rationing has been referred to as not providing services, which are considered to have benefits, to some people (4).

Surgical operations for the total hip replacement and total knee replacement impose a large financial burden on the health system. Although these surgeries are mostly considered as the last-resort solution for treatment, studies show that nonsurgical treatments, such as physical therapy, can be more effective in hip and knee osteoarthritis compared with having no treatment (5). The increased average age of the world population and the higher prevalence of obesity and osteoarthritis together with increased health costs have led to concerns about the health system's capacity to provide these procedures and consequently the need for rationing to ensure that people in most need have access to them (1,6–8).

Main problem

The fast-growing increase in osteoarthritis in low- and middle-income countries is similar to the increase in high-income countries. Some studies have reported a faster increase in some low- and middle-income countries, which could be associated with low levels of education in these countries (9–11). According to a study in the Islamic Republic of Iran, the prevalence of

osteoarthritis was 16.6% in urban areas and 20.5% in rural areas (12).

Arthritis is the second leading disease causing long-term disability in individuals with the disease globally. The years spent with disability from arthritis increased by about 75% between 1990 and 2013 (13). In 2015, among 34 European and some Asian countries, on average 282 total hip replacements and total knee replacements were done per 100 000 people (14). According to reports of one of the main social insurance organizations in the Islamic Republic of Iran, primary orthopaedic surgery has been an obligation of insurance organizations since 2000. There are fewer than 10 000 knee surgeries a year in the country, but this figure is likely to reach to 30 000 in the next 5 years. The cost of this operation was high before the 2014 health system reform plan in the Islamic Republic of Iran, but the operation is now covered by insurance at a percentage rate of charge or free of charge (15). However, because of weaknesses in the plan, especially an inadequate referral system, cost issues and ineffective negotiation with insurance companies, more reforms in health system policies are needed (16).

Aim of the policy brief

We aimed to develop a policy brief that helps the health system in the Islamic Republic of Iran to ration elective hip and knee joint replacement surgery in an equitable and clinically beneficial way.

Methods

We developed this policy brief through a literature review and group discussions among ourselves. We searched PubMed, Scopus, Web of Science, Embase, and Google Scholar up to 2019 using the keywords in English: “rationing”, “hip replacement”, “knee replacement” and “elective surgery”. In addition, the Guideline of American College of Rheumatology on hip and knee osteoarthritis (17) and the clinical guidelines of the Iranian Orthopaedic Society were used to assess the use of guidelines.

Policy options

Different tools have been used in rationing. These tools include waiting lists, clinical guidelines and gate-keeper systems. Shared decision-making is an auxiliary tool that has been effective in cost reduction but it has not been used as a tool on its own. In most countries, these tools have been used together, but to facilitate our analysis, we evaluated the tools separately.

Clinical guidelines

Clinical guidelines are used in New Zealand and the United Kingdom of Great Britain and

Northern Ireland at the micro-level where rationing is based on the views of physicians of indications and contraindications for a medical service (18). However, in developing countries, this method is used at a higher (meso-) level where insurance providers and hospitals determine the clinical guidelines. The main feature of the use of clinical guidelines is the use of evidenced-based medicine. However, there are many disagreements on the indications and contraindications for total knee replacement surgery (19).

In the studies we reviewed, rationing using clinical guidelines is not only considered an independent method of rationing but also an integral part of implementation of other rationing methods. For example, the American College of Rheumatology proposes conservative treatments such as water therapy and aerobic exercise for patients with osteoarthritis rather than surgery (17). The clinical criteria of age, bone status, surgical risk, preoperative procedures and motor limitations have been used to determine whether surgery is appropriate for patients with osteoarthritis or not (20).

In 2006, the United Kingdom established a threshold of body mass index less than 30 kg/m2 for knee and hip surgeries. As a result, 8452 pelvic surgeries and 12 929 knee surgeries were eliminated, with a significant cost reduction (21). Obese people were 1.3 times more likely to have postoperative complications from shoulder, hip and knee surgery than people with normal weight (22). Obesity has also been associated with an increase in admission time in the hospital for people undergoing joint surgery (23). However, such a threshold would seem to deprive many people who are highly in need of this surgery of receiving it (24). Usually, total knee replacement is not done in people younger than 50 years or older than 80 years (25). In younger people, this is because of the potential complications of the surgery, and in older people this is because of their muscular condition and lack of movement and exercise, which can reduce the effectiveness of these operations (26).

Gate-keeper system

In a gate-keeper system, people cannot access second-level services such as the hospital and specialist physician without referral by a general practitioner. This system has two main benefits: (i) cost control by reducing unnecessary interventions, and (ii) use of effective secondary services because physicians are better informed than patients about the quality of services provided by secondary providers (27).

A study showed that 97% of people with severe knee problems, who were receiving secondary services, had initially seen a general practitioner (28). Another study showed that only 67% of orthopaedic referrals by general practitioners were appropriate (29). For appropriate referral, we need a referral threshold based on a clinical guideline that is available to general practitioners,

such systems have been used in different countries. A review study proposed that general practitioners should consider four factors in referral for joint surgery: (i) Do clinical and radiographic characteristics of the patient justify the referral?; (ii) Has the patient had appropriate conservative treatments?; (iii) Does the patient have risk factors that might adversely affect the outcome of surgery?; and (iv) Can these risk factors be modified? (20) In a study in Switzerland in 2000, 20% cost reduction was observed as a result of the gate-keeper system (30).

Waiting lists

Two methods have been used to include the people on a waiting list. In the queue-based model, people are included on the waiting list based on the time of their referral, regardless of disease severity. This method is a chance-based prioritization. The other model is a scoring model where an individual's position on the waiting list is based on specific scores for severity and need (6).

Different scoring systems are used in different countries to accommodate individuals on the waiting list for joint replacement surgery. The most commonly used systems are the Oxford hip and knee score, reduced Western Ontario McMaster osteoarthritis index (WOMAC) score, New Zealand Orthopaedic Association score, clinical priority assessment criteria, and the score of the multi-attribute arthritis prioritization tool (6,31–33).

According to the New Zealand Orthopaedic Association system, patients are scored from 0 to 100. After referral, each patient is scored by a consultant and a nurse at the first visit with the specialist. Based on a defined threshold limit appropriate for conditions in the country, patients below the threshold are referred back to the general practitioner. Patients above the threshold limit are referred to the orthopaedic department and evaluated by a surgeon, who manages the waiting list. A study in New Zealand indicated that of 608 patients examined, 32% were referred back to the general practitioner based on this threshold, thus reducing the number of patients on the waiting list (33).

In England, the use of the Oxford hip and knee score for knee surgery resulted in a cost reduction of £11.8 million a year (£ 1 = US$ 1.6041 in 2011, the date of the cited study) (31). The Oxford hip score questionnaire was translated into Farsi for use in the Islamic Republic of Iran for pre-operative total hip replacement patients (34). The adapted and validated Iranian version of the Oxford hip score questionnaire was found to be reliable and practicable for use with Iranian patients (34).

Shared decision-making

Clinical shared decision-making is not discussed as means of rationing, but can be considered an auxiliary tool for rationing. Shared decision-making can contribute to fair rationing along with other tools. Research has shown that patients are willing to share in the decision-making for their health care (6). In the United Kingdom, it was shown that individuals consider pain severity, inability to walk, costs and postoperative care some of the clinical criteria for joint replacement surgery (20) . Another study showed that 44–55% of people who required total knee replacement and total hip replacement were certainly or probably unwilling to have surgery (35). In another study, if individuals were consulted about their willingness to have surgery after the complications and conditions of the surgery were explained, a 36% cost reduction in joint replacement surgery was seen (36). Thus, prioritization of patients on the waiting list can be based on clinical criteria and the views of the patients themselves about the need for surgery (37).

Policy recommendations

Based on our evaluation of the various methods for rationing surgical care (clinical guidelines, waiting lists, gate-keeper systems, and shared decision-making),

Table 1 lists the disadvantages, benefits, and policy options for each method.

Clinical guidelines

Clinical guidelines are the basis of the rationing method in many cases. Most clinical guidelines are based on evidence; however, clinical guidelines can also be based on consensus (38).

The policy implemented in the United Kingdom to establish a threshold linked to body mass index is a special type of rationing based on clinical guidelines. Although this policy had many critics, it did reduce costs and time to admission to hospital (16) . Furthermore, the age of people can determine candidates for surgery. Clinical guidelines are necessary for rationing, and countries should develop guidelines relevant to their context. The Iranian Orthopaedic Association published a clinical guideline on joint replacement surgery in 2016. However, this guideline has not yet been implemented, so no cost–effectiveness assessment could be done (39).

Waiting list

Although a scoring-based waiting list is preferred to a list based on the time entered on the list, both methods have reduced costs. It should be noted that more developed countries have moved from a queuing model to a scoring model.

Gate-keeper system

As shown in Figure 1 , gate keepers are the first line of rationing. Since most people with serious joint problems go to general practitioners first and the referrals of general practitioners have been effective for accessing treatment (40), this rationing tool is recommended. In addition, an appropriate referral threshold can make the referrals more effective. Given the unsuccessful experience with an urban referral system in the Islamic Republic of Iran in 2005, a system should be designed with a referral threshold based on clinical guidelines. This system should be piloted and the results evaluated.

Proposed rationing system

We propose a system summarized in Figure 1 with three main tools: clinical guidelines, gate keepers and waiting lists, with shared decision-making as an auxiliary tool. For patients to enter the rationing system for treatment through the gate keeper, they must be scored first by the primary health care units based on clinical and radiographic examination, alternative treatments (conservative treatments) and risk factors. Patient whose scores are below the threshold, should be referred by general practitioners to physiotherapists for conservative treatment such as hydrotherapy and exercise. Patients whose scores are above the threshold, should be referred to secondary health care units. At this stage, patients are assessed by specialists and are scored on age, bone condition, risk of surgery and other alternative treatments. Patients whose scores are below this threshold will be referred to physiotherapists again. Patients whose scores are above the threshold should be placed on a waiting list and prioritized according to age, sex, body mass index, occupation and history of total knee or hip replacement. As illustrated in Figure 1, decision-making should be actively shared with patients; they should be encouraged to share their ideas about treatment and other options that may be available.

Implementation of recommendations

In order to implement the recommendations in our policy brief at the mid-level in the Islamic Republic of Iran, the following process should be followed. First, establish a policy-makers' group consisting of heads of universities of medical sciences, heads of hospitals, representative of the orthopaedic association, insurance providers, trusted orthopaedic surgeons, representative of general practitioners and physiotherapists. Establish a research group, consisting of for example general practitioners, specialists and statisticians, to evaluate and validate the clinical guidelines developed in 2016 by the Iranian Orthopaedic Association. Second, modify the clinical guidelines based on the results. Third, establish thresholds for

referral and surgery based on the clinical guidelines. Fourth, reach an agreement with insurance providers and patient representatives on the cost of treatment that insurance covers.

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Limitation des interventions de prothèse totale de la hanche et du genou en République islamique d'Iran en vue de réduire les coûts inutiles : note d'orientation

Résumé

La limitation des services de santé est une composante indissociable du système de santé de tout pays dans l'objectif de parvenir à la couverture sanitaire universelle. La chirurgie programmée pour la prothèse totale de la hanche et du genou constitue une lourde charge financière pour les systèmes de santé. Cette chirurgie doit être effectuée de manière à ce que les personnes qui en ont le plus besoin en bénéficient. Les modèles de limitation de la chirurgie totale de la hanche et du genou ont été examinés afin de proposer la meilleure politique pour limiter ce type d'intervention en République islamique d'Iran. Nous proposons un système comportant trois outils principaux : les lignes directrices cliniques, les filtres et les listes d'attente, avec la prise de décision partagée comme outil auxiliaire. Les patients doivent être évalués au niveau des soins de santé primaires sur la base de l'examen clinique et radiographique, des traitements alternatifs (traitements conservateurs) et des facteurs de risque, avec un seuil défini pour l'orientation-recours. Les patients dont les scores sont supérieurs au seuil doivent être orientés vers les soins de santé secondaires. Ces patients doivent être réévalués par des spécialistes en fonction de leur âge, de leur condition osseuse, du risque chirurgical et d'autres traitements alternatifs. Les patients dont les scores sont supérieurs au seuil doivent être ensuite placés sur la liste d'attente des interventions chirurgicales.

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يُعد ترشيد الخدمات الصحية جزءاً لا يتجزأ من النظام الصحي في أي بلد من أجل تحقيق التغطية الصحية الشاملة . وتُمثِّل الجراحة الاختيارية للاستبدال الكُلِّي للوَرْك والاستبدال الكُلِّي للركبة عبئاً مالياً كبيراً على النُّظم الصحية . وينبغي إجراء هذه الجراحة على نحوٍ يضمن حصول الأشخاص الذين هم في أمَسِّ الحاجة إليها على الخدمة . واستُعرِضت نماذج ترشيد جراحات الاستبدال الكُلِّي للورك والاستبدال الكُلِّي للركبة لاقتراح أفضل سياسة لترشيد مثل هذه الجراحات في جمهورية إيران الإسلامية . ونقترح نظاماً يشتمل على ثلاث أدوات رئيسية : المبادئ التوجيهية السريرية، ومراقبو البوابات، وقوائم الانتظار، مع عملية اتخاذ قرار مشتركة كأداة مساعدة . وينبغي إعطاء درجات للمرضى على مستوى الرعاية الصحية الأوَّلية بناءً على الفحص السريري والتصويري، والعلاجات البديلة (العلاجات التحفظية) ، وعوامل الخطر، مع تحديد حدٍّ أدنى للإحالة . وينبغي إحالة المرضى الذين تتجاوز درجاتهم الحدَّ الأدنى إلى الرعاية الصحية الثانوية . ويجب تقييم هؤلاء المرضى مرةً أخرى من قِبل المتخصصين على أساس العمر وحالة العظام والمخاطر الجراحية والعلاجات البديلة الأخرى . وينبغي وضع المرضى الذين تتجاوز درجاتهم الحد الأدنى على قائمة الانتظار للخضوع للجراحة .

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