Undetermined impact of patient decision support interventions on healthcare costs and savings: systematic review

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EDITORIAL by Katz

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STUDY QUESTION

Do patient decision support interventions lead to cost savings?

SUMMARY ANSWER

There is currently insufficient evidence to be confident that the implementation of patient decision support interventions leads to system-wide savings.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

The use of patient decision support interventions as a means to generate healthcare savings has been widely advocated, but the extent and quality of evidence was unclear. A few studies provide evidence of savings, but they have a high risk of bias and their economic assessments are of moderate quality and took place over short time periods. Although there is good evidence that patients benefit when they become better informed, there is not yet sufficient evidence to be fully confident that the implementation of patient decision support interventions will consistently lead to system-wide savings.

Selection criteria for studies

We considered studies that evaluated interventions designed to "help people make specific and deliberative choices among options (including the status quo) by providing (at the minimum) information on the options and outcomes relevant to a person's health status and implicit methods to clarify values." We considered all primary peer reviewed studies, including randomized controlled trials and economic evaluations as well as experimental and quasi-experimental designs utilizing a comparison group. We excluded studies that lacked quantitative data on savings, costs, monetary value, and/or resource utilization. The Center for Reviews and Dissemination and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommend the use of checklists to appraise study quality. Three researchers (TW, PJB, CO'N) assessed the quality of economic evaluations in included studies using Drummond's 10 item checklist; items were recorded as being present or absent (score=1 or 0). Two researchers (TW and PJB) assessed risk of bias using Cochrane's six item checklist and items were recorded as low risk (score=0), indeterminate or high risk (score=1). Disagreements were resolved by discussion.

Primary outcome

For each study, we examined the savings or additional spending that followed implementation of patient decision aids, the costs associated with delivering patient decision aids, and rates of treatment utilization in both the control and decision aid groups. Because savings are purported to be associated with changes in treatment utilization, we calculated absolute differences in utilization after the implementation of decision aids and projected a potential impact on utilization rates per 100 patients exposed.

Main results and role of chance

After reviewing 1508 citations, we included seven studies with eight analyses. Of these seven studies, four analyses predict system-wide savings, with two analyses from the same study. The predicted savings range from $8 (£5, €6) to $3068 per patient. Larger savings accompanied reductions in treatment utilization rates. Overall, the impact on utilization rates was mixed. Authors used heterogeneous methods to allocate costs and calculate savings.

Bias, confounding, and other reasons for caution

Quality scores for the economic analyses were low to moderate (median 4.5, range 0-8 out of 10) and risk of bias across the studies was moderate to high (median 3.5, range 3-6 out of 6) with studies predicting the most savings having the highest risk of bias.

Study funding/potential competing interests

This study was supported by the Dartmouth Center for Health Care Delivery Science. CO'N was supported by a HRB Research Leaders Award 2013 (RL/2013/16).

Characteristics of studies included in review of patient decision support interventions (DESI)

Study	Population	Sample size	Per patient costs to implement DESI*	Per patient savings*	Quality†	Risk of bias‡
Arterburn (2012)	Patients with hip osteoarthritis	1788	None reported	$3068	0	6
	Patients with knee osteoarthritis	7727		$3068		
Kennedy (2002)	Women with menorrhagia	894	$21	$725	6	3
Murray (2001a)	Men with benign prostatic hypertrophy	112	$400	−$517§	5	3
Murray (2001b)	Peri-menopausal women	205	$304	−$303§	4	3
Van Peperstraten (2010)	Couples on IVF treatment waiting list	308	$145	$219	8	4
Vuorma (2004)	Women with menorrhagia	363	$10	$409	3	3
Wennberg (2010)	Patients with preference sensitive conditions	18 351	$2/month	$7.96	7	4
Subanalysis by Veroff (2013)		60 185	<$5/month	$23.27	6	5

*Currency converted to US dollars based on rates at 15 June of publication year and rounded to nearest dollar.
†Possible range 0-10 with higher scores indicating higher quality.
‡Possible range 0-6, with higher scores indicating greater risk of bias.
§Negative savings represent increases in spending.

Endovascular or open repair strategy for ruptured abdominal aortic aneurysm: 30 day outcomes from IMPROVE randomised trial

IMPROVE trial investigators

EDITORIAL by Björck

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STUDY QUESTION

Should patients with clinical suspicion of ruptured abdominal aortic aneurysm be managed by an endovascular strategy (endovascular repair if anatomically suitable) or by open repair, to optimise survival and other outcomes?

SUMMARY ANSWER

30 day mortality was similar following an endovascular strategy (35%) and open surgical repair (37%), but women seemed to have lower mortality and patients were discharged home sooner with an endovascular strategy.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

For selected patients, observational studies indicate that 30 day mortality is much lower after endovascular repair than after open surgical repair, but two small randomised trials failed to show any survival advantage with endovascular repair. The large IMPROVE randomised trial starts to identify patients who may benefit from an endovascular strategy (such as women) and shows that, after 30 days, the endovascular strategy did not cost more than open repair and offers the patient earlier discharge home.

Design

This was a randomised controlled trial, stratified by centre, with computer generated allocation of patients to either an endovascular strategy (with open repair reserved for those anatomically unsuitable for conventional endovascular repair) or open repair.

Participants and setting

Eligible patients (n=613; 480 men) with a clinical diagnosis of ruptured aneurysm were recruited at 29 UK vascular centres and one Canadian centre, before evaluation of aortic anatomy, between 2009 and 2013. We randomised 316 patients to the endovascular strategy (275 confirmed ruptures and 8 acute symptomatic aneurysms (174/272 anatomically suitable for endovascular repair) and 33 other final diagnoses) and 297 patients to open repair (261 confirmed ruptures, 14 symptomatic aneurysms, and 22 other final diagnoses).

Main outcome measures

The primary outcome was 30 day mortality, with 30 day costs and time and place of discharge as secondary outcomes.

Results

Thirty day mortality was 35.4% (112/316) in the endovascular strategy group and 37.4% (111/297) in the open repair group: odds ratio 0.92 (95% confidence interval 0.66 to 1.28; P=0.62); odds ratio after adjustment for age, sex, and Hardman (morbidity) index 0.94 (0.67 to 1.33). Prespecified subgroup analyses showed that women seemed to benefit more than men from an endovascular strategy (interaction test, P=0.02) but no convincing differences with respect to Hardman index or age. For patients with confirmed rupture, 30 day mortality was 36% (100/275) in the endovascular strategy group and 41% (106/261) in the open repair group (P=0.31). More patients in the endovascular strategy group than in the open repair group were discharged directly to home (94% (189/201) *v* 77% (141/183); P<0.001). Average 30 day costs were similar between the randomised groups, with an incremental saving for the endovascular strategy versus open repair of £1186 (−625 to 2997).

Harms

The number of patients who died before aneurysm repair (endovascular strategy 6% (n=16), open repair 7% (19)) or who needed further interventions within 30 days (18% (43) *v* 20% (48)) did not differ between the randomised groups.

Bias, confounding, and other reasons for caution

All analyses were intention to treat. Overall, for 64/613 (10%) patients care did not adhere to the trial protocol. Although 30 day mortality was 38/150 (25%) for endovascular repair in the endovascular strategy group, the estimated unbiased causal odds ratio for 30 day mortality in a trial in which everyone adhered to randomised allocation still showed no significant benefit for the endovascular strategy (odds ratio 0.82, 0.51 to 1.32).

Generalisability to other populations

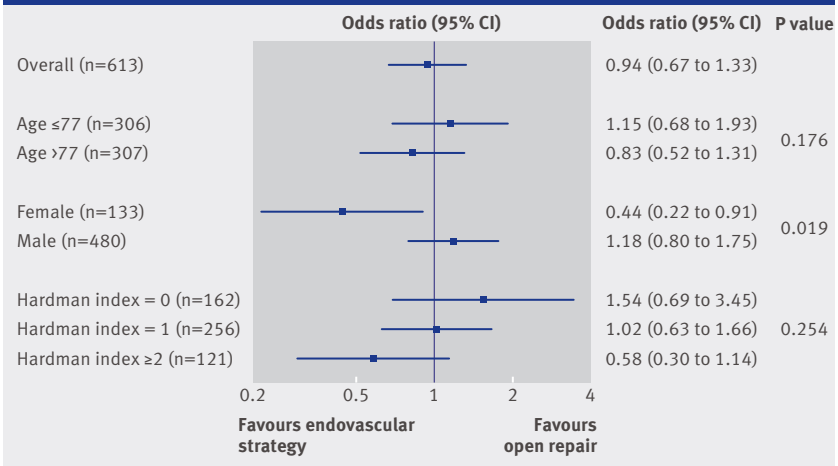
About two thirds of potentially eligible patients were recruited to the trial, and the proportion of women was similar in recruited and non-recruited patients.

Study funding/potential competing interests

This trial was supported by UK Health Technology Assessment award 07/37/64.

Trial registration number Current controlled trials ISRCTN48334791.

30 day mortality by randomised group, with subgroup analyses for age, sex, and Hardman index



Safety of benzodiazepines and opioids in very severe respiratory disease: national prospective study

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STUDY QUESTION

Do benzodiazepines and/or opioids increase the risk of admission to hospital or death in patients with chronic respiratory failure from chronic obstructive pulmonary disease (COPD)?

SUMMARY ANSWER

Lower dose opioids (≤30 oral morphine equivalents/day) were not associated with increased admission or mortality, whereas benzodiazepines and higher dose opioids were associated with increased mortality.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Opioids can relieve breathlessness but safety data in patients with severe COPD are limited. This study provides evidence that low dose opioids are safe to use for relief of symptoms in patients with COPD and respiratory failure.

Participants and setting

We included patients aged 45 or older who started long term oxygen therapy for COPD in 2005-09 in the national Swedevox Register. Swedevox covers about 85% of patients starting long term oxygen therapy in Sweden.

Design, size, and duration

We prospectively followed 2249 patients (59% women) until 31 December 2009. No patient was lost to follow-up. Data were obtained from national registers on drugs (the prescribed drug register), morbidity and admission to hospital (the patient register), and mortality (the causes of death register). The daily dose of benzodiazepines and opioids was estimated based on prescriptions during three months before patients started long term oxygen therapy and expressed as defined daily doses (DDD). Low dose treatment was defined as ≤0.3 defined daily doses (≤30 mg oral morphine equivalents) a day. When patients started long term oxygen therapy, 535 (24%) used benzodiazepines and 509 (23%) used opioids. During follow-up, 1681 (76%) patients were admitted to hospital and 1129 (50%) died.

Main results and the role of chance

Use of benzodiazepines and opioids was not associated with increased admission to hospital (adjusted hazard ratios 0.98 (95% confidence interval 0.87 to 1.10) and 0.98 (0.86 to 1.10), respectively). Benzodiazepines were associated with increased mortality (1.21, 1.05 to 1.39). Lower dose opioids (≤30 mg oral morphine equivalents/day) were not associated with increased mortality (1.03, 0.84 to 1.26), in contrast with higher dose opioids (1.21, 1.02 to 1.44). Concurrent benzodiazepines and opioids in lower doses were not associated with increased admission to hospital (0.86, 0.53 to 1.42) or mortality (1.25, 0.78 to 1.99). The associations were not modified in patients who were naive to the drugs or by hypercapnia.

Bias, confounding, and other reasons for caution

We adjusted the effect estimates for age, sex, arterial blood gases, body mass index, performance status, previous admissions, comorbidities, and concurrent drugs. Drug exposure at baseline was a good proxy for use during follow-up. Most exposed patients filled regular prescriptions, which supports the assumption that they actually took the drugs. The level of follow-up and healthcare given to patients could influence the outcomes, and the findings should be interpreted in the context of current levels of clinical contact. Lack of residual bias, including confounding by indication, needs to be validated through randomised trials.

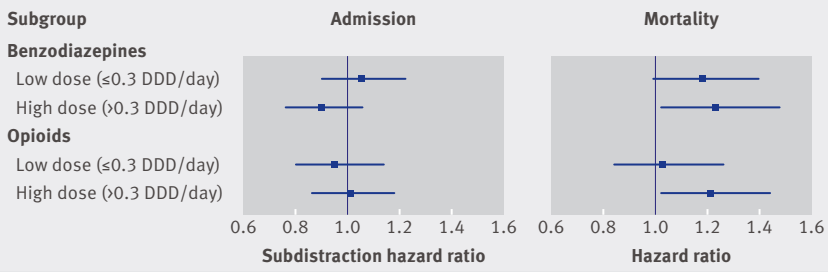
Generalisability to other populations

We studied a population based cohort of patients with oxygen dependent COPD in Sweden, and the findings likely have high applicability to current clinical practice in similar settings around the world.

Study funding/potential competing interests

This study was funded by the Research Council of Blekinge and the Swedish Heart-Lung Foundation.

Adjusted hazard ratios and 95% confidence intervals in patients with COPD



Failure rate of cemented and uncemented total hip replacements: register study of combined Nordic database of four nations

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STUDY QUESTION

What is the failure rate of cemented, uncemented, hybrid, and reverse hybrid total hip replacements in patients aged 55 years or older?

SUMMARY ANSWER

The survival of cemented implants for total hip replacement was higher than that of uncemented implants in the age group 65 years or older.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Cemented fixation has been the ideal method of total hip replacement in many countries. In this multinational register study the survival of cemented implants for total hip replacements was higher than that of uncemented implants in patients aged 65 years or older.

Participants and setting

347 899 total hip replacements performed during 1995-2011 in patients aged 55 years and older from Sweden, Norway, Denmark, and Finland.

Design, size, and duration

Register study based on information from the Nordic Arthroplasty Register Association database. We assessed the survival of total hip replacements using cemented, uncemented, hybrid (uncemented cup with cemented stem), and reverse hybrid (cemented cup with uncemented stem) implants at 10 and 15 years. We presented implant survival data for three age groups: 55-64, 65-74, and 75 or older.

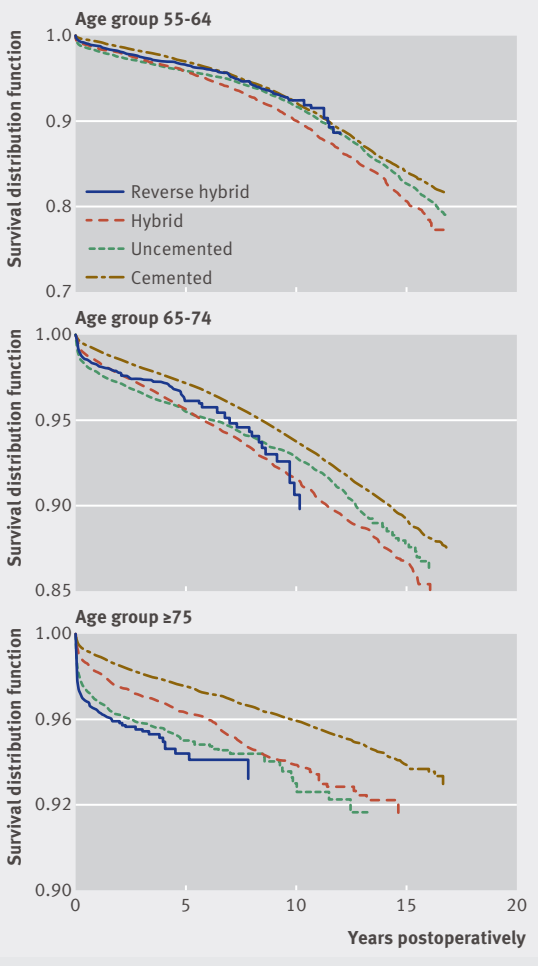
Main results and the role of chance

The proportion of total hip replacements using uncemented implants increased rapidly towards the end of the study period. The 10 year survival of cemented implants in patients aged 65 to 74 and 75 or older (93.8%, 95% confidence interval 93.6% to 94.0% and 95.9%, 95.8% to 96.1%, respectively) was higher than that of uncemented (92.9%, 92.3% to 93.4% and 93.0%, 91.8% to 94.0%), hybrid (91.6%, 90.9% to 92.2% and 93.9%, 93.1% to 94.5%), and reverse hybrid (90.7%, 87.3% to 93.2% and 93.2%, 90.7% to 95.1%) implants. The survival of cemented (92.2%, 91.8% to 92.5%) and uncemented (91.8%, 91.3% to 92.2%) implants in patients aged 55 to 64 was similar. During the first six months the risk of revision with cemented implants was lower than with all other types of fixation in all age groups.

Bias, confounding, and other reasons for caution

Because our dataset includes only basic information common to all national registers there is potential for residual confounding. Furthermore, registers have different strategies for presenting data, which may also be an obstacle to uniform interpretation of data on risks of revision.

Kaplan-Meier implant survival curves for total hip replacements by fixation type and age groups



Generalisability to other populations

Interpretation of comparisons based on data derived from diverse national registers should be performed cautiously. A worldwide database common to all national registers enabling direct comparison of hip replacements would noticeably increase the reliability of arthroplasty data.

Study funding/potential competing interests

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