RESEARCH

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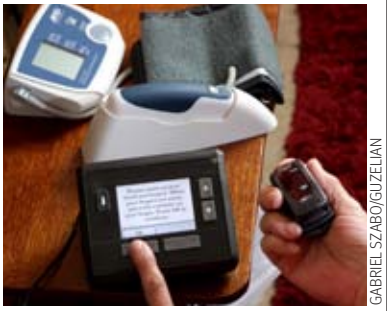

GABRIEL SZABO/GUZELIAN

Specialty in the spotlight—the infectious diseases portal

In two weeks' time, London will welcome large numbers of people for the Olympic Games, so infectious diseases are the subject of much debate. BMJ Group's infectious diseases portal includes all the latest articles, discussions, and learning resources from across the Group's products. The portal also links to our infectious diseases forum (http://doc2doc.bmj.com/forums/open-clinical_infectious-disease) on doc2doc, our global clinical community. Visit the portal at www.bmj.com/specialties/infectious-diseases

Recently published

- Cutaneous tuberculosis caused by isoniazid resistant *Mycobacterium tuberculosis*
  http://casereports.bmj.com/content/2012/bcr-2012-006253
- Foodborne trematodiasis
  http://www.bmj.com/content/344/bmj.e4093
- Hospital-acquired pneumonia
  http://bestpractice.bmj.com/best-practice/monograph/720.html

WHAT OUR READERS THINK

Effect of telehealth on use of secondary care and mortality: findings from the Whole System Demonstrator cluster randomised trial (see also p 16)

This study evaluated the effect of remote exchange of data between patients and healthcare professionals as part of patients' diagnosis and management ("telehealth") in 179 general practices in three areas in England and found that telehealth was associated with lower mortality and emergency admission rates. Our rapid respondents took a critical view:

"A particular anxiety in COPD has been that resources will be diverted towards unproven telehealth interventions at the expense of high-value interventions with a strong evidence base, specifically pulmonary rehabilitation, which remains significantly under-provided in the UK."

"The authors have not commented formally on the substantial mismatch between their findings and conclusions (which were measured and cautious) and those used by the Department of Health to inform policy (which were one sided and sensationalist), although individual Whole System Demonstrator researchers have expressed misgivings . . . The Department of Health's cherry picking of unanalysed data to put on its website before the trial had finished recruiting was scientifically inappropriate but politically expedient . . . In failing to require the authors to consider conflicts of interest by the state (whose intention to implement telehealth was enshrined in policy before the results were analysed), and in privileging randomised trials over study designs that allow analysis of political influences, the BMJ has let itself be used as a pawn by an increasingly powerful industrial-political complex."

"If hospital admission is the main reason for the greater mortality seen in the control group then this should occur irrespective of the original inclusion diagnosis. We challenge the authors to present the relative risk of admission and death in their three diagnostic categories. If there is no difference then whilst the WSD demonstrates a significant impact on admissions, whether this is due to the intervention, or the unfulfilled expectation of telehealth, is a moot point."

- Read more, and submit your own response, at
  http://www.bmj.com/content/344/bmj.e3874?tab=response-form

RESEARCH ONLINE: For this and other new research articles see www.bmj.com/research

Effect of adding a diagnostic aid to best practice to manage suspicious pigmented lesions in primary care

This randomised controlled trial set in 15 general practices in England included 1297 adults with pigmented skin lesions not immediately diagnosed as benign. The authors found that using a new computerised diagnostic tool, the MoleMate system, did not improve appropriateness of referral. The systematic application of best practice guidelines alone was more accurate than the MoleMate system, and both performed better than reports of current practice. The authors conclude that systematic application of best practice guidelines (including the seven point checklist) should therefore be the paradigm for management of suspicious skin lesions in primary care.

Effect of telehealth on use of secondary care and mortality: findings from the Whole System Demonstrator cluster randomised trial

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EDITORIAL by Car and colleagues
FEATURE, p 20

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STUDY QUESTION

Is hospital use affected by home based telehealth systems, which involve the remote exchange of data between patients and healthcare professionals?

SUMMARY ANSWER

Telehealth is associated with reduced hospital use in a group of patients with chronic disease.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Evidence showing the effect of telehealth has been based on assimilating findings from several small trials, often with conflicting results. Among people with chronic obstructive pulmonary disease, heart failure, or diabetes, a broad class of telehealth technologies is associated with reduced rates of mortality and emergency admissions, in relation to the routine delivery of secondary healthcare.

Design

We did a pragmatic, multisite, cluster randomised trial comparing telehealth with usual care, using data from routine administrative datasets. The general practice was the unit of randomisation. Telehealth involved remote exchange of data between patients and healthcare professionals as part of patients' diagnosis and management. Usual care reflected normal services, excluding telehealth. Trial and administrative data were linked at the person level to apply a standard risk adjustment model and estimate effects on resource use.

Participants and setting

Between May 2008 and November 2009, 3230 participants with diabetes, chronic obstructive pulmonary disease, or heart failure were recruited from 179 general practices in three areas in England.

Primary outcome(s)

Proportion of participants admitted to hospital over 12 months; secondary outcomes included mortality and different types of hospital activity, including notional costs.

Main results and the role of chance

During the trial, 48.2% (n=763) control and 42.9% (n=674) intervention patients were admitted to hospital (odds ratio 0.82, 95% confidence interval 0.70 to 0.97, P=0.017). Fewer patients died in the intervention group (4.6% *v* 8.3%; odds ratio 0.54, 0.39 to 0.75, P<0.001). Group differences in admission and mortality proportions remained significant after adjustment. The mean number of emergency admissions differed (crude rates per head, 0.54 intervention *v* 0.68 control). These changes were significant in unadjusted comparisons (incidence rate ratio 0.81, 0.65 to 1.00, P=0.046), and remained significant after adjusting for a predictive risk score, but not after adjusting for baseline characteristics. Length of hospital stay was significantly shorter in the intervention group. Notional hospital costs were £188 lower among intervention participants but differences were not significant.

Hospital use and mortality during 12 month follow-up

Endpoint (interpretation)	Estimate (95% CI)
Admission proportion (odds ratio)	0.82 (0.70 to 0.97)
Mortality (odds ratio)	0.54 (0.39 to 0.75)
Emergency admissions (incidence rate ratio)	0.81 (0.65 to 1.00)
Elective admissions (incidence rate ratio)	0.89 (0.75 to 1.07)
Outpatient attendances (incidence rate ratio)	0.96 (0.81 to 1.13)
Emergency department visits (incidence rate ratio)	0.85 (0.70 to 1.05)
Bed days (difference in geometric means)	−0.64 (−1.14 to −0.10)
Tariff costs (difference in geometric means (£))	−449 (−964 to 243)

Harms

None reported.

Bias, confounding, and other reasons for caution

This analysis is one of a series planned by the Whole System Demonstrator Evaluation Team. Although use of administrative datasets avoided problems of non-response, data quality was not directly under our control. Differences in hospital activity were greatest at the beginning of the trial, when we observed a large increase in the control group; group differences for the primary outcome would not have been significant if we excluded activity from the first three months of the trial. This increase may have been caused by the trial recruitment processes so the trial could have affected the context in which care was delivered. Selection bias is a concern in cluster randomised trials, but we found no large differences in baseline characteristics and applied case mix adjustment.

Generalisability to other populations

The broad eligibility criteria, diversity between pilot sites, and large scale of the study meant that the telehealth approach should be readily generalisable to routine care delivery.

Study funding/potential competing interests

This study was funded by the Department of Health in England; the Whole System Demonstrator trial was sponsored by the University College London Hospitals and University College London.

Trial registration number

International Standard Randomised Controlled Trial Number Register ISRCTN43002091.

Effectiveness of home based early intervention on children's BMI at age 2: randomised controlled trial

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bmj.com/podcasts

BMJ assistant editor Helen MacDonald speaks to lead author Li Ming Wen http://www.bmj.com/podcast/2012/07/06/obamas-healthcare-reforms-trial

STUDY QUESTION

Can a home based early intervention delivered by trained community nurses over the first two years lead to a reduction in mean BMI in children aged 2?

SUMMARY ANSWER

A home based early intervention delivered by trained community nurses is effective in reducing mean BMI in children aged 2.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

A considerable number of children are already overweight or obese at the age of 2, which could have adverse effects on later health. An early childhood obesity prevention programme, delivered by community nurses in the homes of new mothers, was effective in reducing mean BMI in children aged 2.

Design

A parallel randomised controlled trial with blinded outcome assessment was conducted with block randomisation and computer generated allocation. The intervention consisted of eight home visits from specially trained community nurses delivering a staged home based intervention, one in the antenatal period and seven after birth (at 1, 3, 5, 9, 12, 18 and 24 months). The timing of visits was designed to coincide with early childhood developmental milestones. The intervention promoted breast feeding, appropriate timing of introduction of solids, "tummy time," and active play, as well as family nutrition and physical activity. Families in both the control and intervention group received the usual childhood nursing service from community health service nurses.

Differences in mean BMI, mean weight (kg), and mean length (cm) at 24 months in study of effect of home based early intervention on BMI in children

	Mean (95% CI)		Intervention–control (95% CI)	P value
	Intervention	Control		
Complete cases analysis (n=249 in intervention, 234 in control)*				
BMI	16.49 (16.27 to 16.71)	16.87 (16.66 to 17.08)	−0.38 (−0.68 to −0.08)	0.01†
Weight	12.98 (12.77 to 13.19)	13.15 (12.96 to 13.35)	−0.17 (−0.46 to 0.11)	0.24†
Length	88.73 (88.28 to 89.17)	88.42 (87.96 to 88.88)	0.31 (−0.34 to 0.95)	0.35†
Age (months)	24.16 (24.09 to 24.23)	24.25 (24.16 to 24.34)	−0.09 (−0.02 to 0.20)	0.12†
Multiple imputation analysis (n=255 in intervention, 242 in control)‡				
BMI	16.49 (16.27 to 16.71)	16.87 (16.66 to 17.07)	−0.38 (−0.68 to −0.08)	0.01§
Weight	12.99 (12.79 to 13.20)	13.15 (12.96 to 13.35)	−0.16 (−0.44 to 0.12)	0.27§
Length	88.75 (88.31 to 89.19)	88.41 (87.94 to 88.88)	0.34 (−0.30 to 0.98)	0.30§
Multiple imputation analysis (n=337 in intervention, 330 in control)¶				
BMI	16.53 (16.33 to 16.72)	16.82 (16.64 to16.99)	−0.29 (−0.55 to −0.02)	0.04§
Weight	13.02 (12.82 to 13.21)	13.15 (12.95 to 13.35)	−0.13 (−0.43 to 0.16)	0.37§
Length	88.71 (88.15 to 89.28)	88.51 (87.93 to 89.10)	0.20 (−0.66 to 1.06)	0.64§

*14 missing BMI values among 497 remaining at 24 months.
†t test.
‡In 497 remaining at 24 months, with 14 missing values imputed.
§F test.
¶In all 667 randomised, with 184 missing values imputed.

Participants and setting

The Healthy Beginnings Trial was conducted with a total of 667 first time mothers and their infants in socially and economically disadvantaged areas of Sydney, Australia, during 2007-10.

Primary outcome

The primary outcome was the child's BMI at age 2 (at this age, the healthy BMI ranges are 14.12 to 18.41 for boys and 13.90 to 18.02 for girls). Secondary outcomes were eating habits (intake of fruit and vegetables, consumption of chips and snacks, and having a meal in front of the TV), time spent watching TV, and active play time, as well as the mothers' dietary behaviours, time spent watching TV, and physical activity.

Main results and the role of chance

Four hundred and ninety seven mothers and their children (75%) completed the trial. An intention to treat analysis with all 667 participants recruited, and multiple imputation of BMI for the 170 lost to follow-up and the 14 with missing data, showed that mean BMI was significantly lower in the intervention group (16.53) than the control group (16.82, with a difference of 0.29 (95% confidence interval 0.02 to 0.55, P=0.04). The intervention also significantly increased the proportion of children receiving more than one serving a day of vegetables by 7% (1% to 13%) and significantly reduced the proportion of children watching TV for more than 60 minutes a day by 8% (1% to 15%). The home based early intervention delivered by trained community nurses was effective in reducing mean BMI for children at age 2.

Harms

There were no harms associated with the intervention.

Bias, confounding, and other reasons for caution

The 25% loss to follow-up could lead to incomplete study results and might have biased the findings, though the main reasons for loss to follow-up were similar across both groups.

Generalisability to other populations

The generalisability might be limited because of the locality of the study area.

Study funding/potential competing interests

This study was funded by the Australian National Health and Medical Research Council (ID No 393112).

Trial registration number

Australian Clinical Trial Registry No 12607000168459.

Long term alcohol intake and risk of rheumatoid arthritis in women: a population based cohort study

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STUDY QUESTION

What is the association between alcohol drinking and risk of rheumatoid arthritis in women?

SUMMARY ANSWER

Moderate consumption of alcohol is associated with reduced risk of rheumatoid arthritis.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Case-control studies have reported that drinking alcohol is associated with a lower risk of rheumatoid arthritis, but prospective cohort studies did not observe a significant association. The present prospective study showed that women with a consistent consumption of more than three alcoholic drinks a week for at least 10 years had about half the risk of developing rheumatoid arthritis as never drinkers.

Participants and setting

This study is of the Swedish Mammography Cohort, which includes women from central Sweden born between 1914 and 1948.

Design, size, and duration

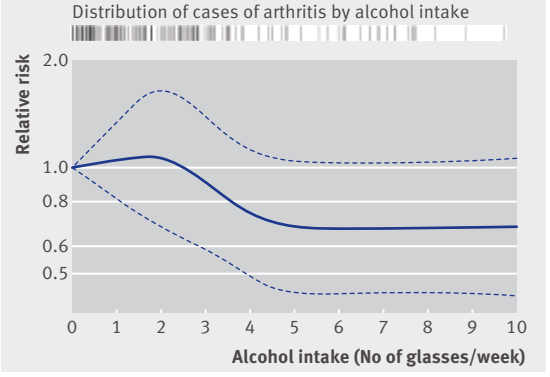
In this prospective, population based, cohort study of 34 141 women with repeated assessments of alcohol consumption (self reported in 1987 and 1997 with a food frequency questionnaire), 197 incident cases of rheumatoid arthritis were identified during the follow-up period from 1 January 2003 to 31 December 2009.

Main results and the role of chance

There was a statistically significant 37% decrease in risk of rheumatoid arthritis among women who drank more than four glasses of alcohol a week in 1997 compared with women who drank less than one glass a week or who never drank alcohol (relative risk 0.63 (95% CI 0.42 to 0.96)) (figure). (1 glass of alcohol = 15 g of ethanol, corresponding to about 500 mL of beer, 150 mL of wine, or 50 mL of liquor.)

Analysis of long term alcohol consumption showed that women who reported drinking more than three glasses of alcohol a week in both 1987 and 1997 had a 52% decreased risk of rheumatoid arthritis compared with never drinkers at both assessments (relative risk 0.48 (0.24 to 0.98)). The rate of incident rheumatoid arthritis was 6.5 per 10 000 person years among those who drank more than three glasses a week compared with 8.6 per 10 000 person years among never drinkers.

Relative risk (95% CI) of rheumatoid arthritis by alcohol consumption



Bias, confounding, and other reasons for caution

In this prospective population based study the ascertainment of the alcohol exposure was independent from the ascertainment of the outcome, thus not affected by differential recall bias. We did not have information on family history of rheumatoid arthritis, a possible confounder of the association under study and a proxy for shared familial (genetic and environmental) factors. Moreover, we could not evaluate the effect of high doses of alcohol on risk of rheumatoid arthritis because of the lack of heavy drinkers in our cohort of elderly Swedish women, who traditionally drink relatively little alcohol (only 1.4% of women in the cohort consumed more than two glasses of alcohol a day, of whom two women developed rheumatoid arthritis during follow-up).

Generalisability to other populations

These results are in accordance with the previously reported inverse association between moderate alcohol consumption and risk of cardiovascular disease and add to the evidence that moderate alcohol consumption is not harmful and can be protective against such a chronic disease as rheumatoid arthritis. However, the effect of higher doses of alcohol on the risk of rheumatoid arthritis remains unknown.

Study funding/potential competing interests

The study was supported by research grants from the Swedish Research Council's Committee for Research Infrastructure for maintenance of the Swedish Mammography Cohort, and from the Karolinska Institute's award for PhD students.

Cost effectiveness of abdominal aortic aneurysm screening and rescreening in men in a modern context: evaluation of a hypothetical cohort using a decision analytical model

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STUDY QUESTION

Is it cost effective for a national health service to screen or rescreen men older than 65 years for abdominal aortic aneurysm?

SUMMARY ANSWER

At conventional thresholds, screening is more cost effective than not screening, and men should be rescreened at least once.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Several studies have shown one-off screening for abdominal aortic aneurysm in men to be cost effective, but whether rescreening is also cost effective remains to be examined. We developed a decision model that reflected the modern world with a reduced prevalence of aneurysms, higher rate of incidental detection, and new treatment technology to assess the cost effectiveness of four strategies (no screening, screening once, screening twice with five year intervals, and lifetime rescreening at five year intervals).

Main results

Screening men for abdominal aortic aneurysms seems to be highly cost effective compared with no screening. We found a 92% probability that some form of screening will be cost effective at a threshold of £20 000 (€24 790; $31 460). If men with an aortic diameter of 25-29 mm at initial screening were rescreened once, 452 men per 100 000 initially screened would benefit from early detection, whereas lifetime rescreening would detect 794 men per 100 000. We estimated the associated incremental cost effectiveness ratios for rescreening once and lifetime rescreening to be £10 013 and £29 680 per quality adjusted life year (QALY), respectively. The individual probability of being the most cost effective strategy was higher for each rescreening strategy than for the screening once strategy (in view of the £20 000 threshold).

Design

We used a Markov model to simulate relevant lifetime key events and the associated costs and QALYs under each rescreening strategy.

Source(s) of effectiveness

Apart from rupture rates that were informed from a systematic literature review, parameter estimates were the result of original analyses of a combination of research registries from two Danish screening trials, the Danish Vascular Registry and national registries for causes of death. We determined general population mortality from the most recent Danish national statistics and based quality adjustment on a representative Danish population survey. The effects of screening were adjusted according to meta-analyses concluding that screening significantly reduces non-aneurysm related mortality and the mortality risk of elective repair. Costs (£ in 2010) were informed from previously reported Danish microcosting studies.

Predicted numbers of key events if men with aortic diameter of 25-29 mm at initial screening are rescreened

	No of events per 100 000 men	
	Rescreening once after five years	Rescreening for lifetime every five years
Referrals	1851	2978
Attend rescan	1418	2565
Aneurysm findings at rescan		
No growth	966	624
Aortic diameter 30-49 mm	364	653
Aortic diameter 50-54 mm	57	91
Aortic diameter ≥55 mm	31	50
Aneurysms detected	452	794

Results of sensitivity analysis

The cost effectiveness of some form of screening compared with no screening seemed robust under alternative scenarios. The choice between screening and rescreening strategies was found to be sensitive to alternative assumptions and, in particular, if enrolment in annual or biannual follow-up substantially affected quality of life.

Limitations

The joint decision uncertainty seemed to be largely driven by a lack of evidence on quality of life during follow-up, as well as on growth and rupture rates that relates to a modern context with improved general cardiovascular prevention.

Study funding/potential competing interests

The Health Research Fund of Central Denmark Region and the Research Fund of Viborg Hospital funded the work. JSL was sponsored by the 7th European Framework programme. The sponsors had no role in the study design; in the collection, analysis, and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication.