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Breast cancer detection and survival among women with cosmetic breast implants: systematic review and meta-analysis of observational studies

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STUDY QUESTION

Does a difference exist in the stage distribution and post-diagnosis survival among women diagnosed as having breast cancer between those who have previously received breast implants for cosmetic purposes and those with no implants?

SUMMARY ANSWER

The accumulating evidence suggests that cosmetic breast implants adversely affect breast cancer specific survival following the diagnosis of such disease.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS

Breast implants are radio-opaque at mammography, impairing the visualisation of breast tissue and raising the concern that they may impair the ability to identify breast cancer at an early stage when survival is generally more favourable. On the basis of studies published to date, cosmetic breast augmentation seems to adversely affect the survival of women who are subsequently diagnosed as having breast cancer.

Selection criteria for studies

We did a systematic search of the literature published before September 2012 in Medline, Embase, Global health, CINAHL, IPAB, and PsycINFO. Eligible publications were those that included women diagnosed as having breast cancer who had had augmentation mammaplasty for cosmetic purposes. Two meta-analyses evaluated whether the stage distribution among women diagnosed as having breast cancer differed between those who had received breast implants for cosmetic purposes and those with no implants and whether cosmetic breast augmentation before the detection of breast cancer was a predictor of post-diagnosis survival.

Primary outcome(s)

The primary outcomes were stage distribution of breast cancer at diagnosis as defined by non-localised (regional and distant) versus localised stage and breast cancer specific mortality.

Main results and role of chance

The overall odds ratio of our first meta-analysis based on 12 studies was 1.26 (95% confidence interval 0.99 to 1.60; P=0.058; I^2=35.6%) for a non-localised stage of breast cancer at diagnosis comparing women with breast cancer who had implants and women with breast cancer who did not have implants. The second meta-analysis, based on five studies, evaluated the relation between cosmetic breast implantation and survival. This meta-analysis showed reduced survival after breast cancer among women who had received implants compared with those who had not (overall hazard ratio for breast cancer specific mortality 1.38, 1.08 to 1.75).

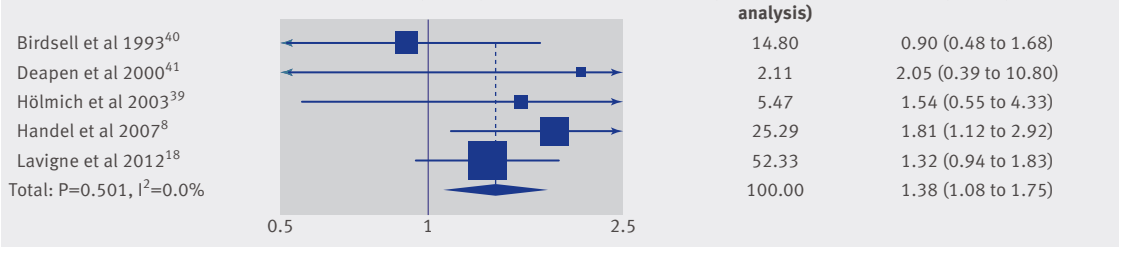
Bias, confounding, and other reasons for caution

These findings should be interpreted with caution, as some studies included in both meta-analyses did not adjust for potential confounders such as age and period of diagnosis. In addition, the meta-analysis on survival included a relatively small number of studies. Misclassification biases within each study could also be a factor affecting study specific measures of association and consequently our pooled effect. Although we have evaluated the quality of the studies by using an assessment scale, no threshold scores were available to distinguish between "good" and "poor" quality studies, which could limit our results as we may have included studies of poorer quality in our analyses.

Study funding/potential competing interests

This work was supported through scholarship grants by the Unité de Recherche en Santé des Populations, Cancer Care Ontario, and the Public Health Agency of Canada.

Association between cosmetic breast implants and breast cancer specific survival



The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers

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STUDY QUESTION What is the life expectancy of people with mental illness in Western Australia compared with the general population, and how has this changed over time?

SUMMARY ANSWER The life expectancy gap between people with mental illness and the general population in Western Australia, 1985-2005, increased for males from 13.5 to 15.9 years and for females from 10.4 to 12.0 years.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS People with mental illness have a shorter life expectancy than the general population. In Western Australia the gap increased between 1985 and 2005, and the majority of excess mortality in people with mental illness was attributed to common physical health conditions such as heart disease, respiratory disease, and cancer.

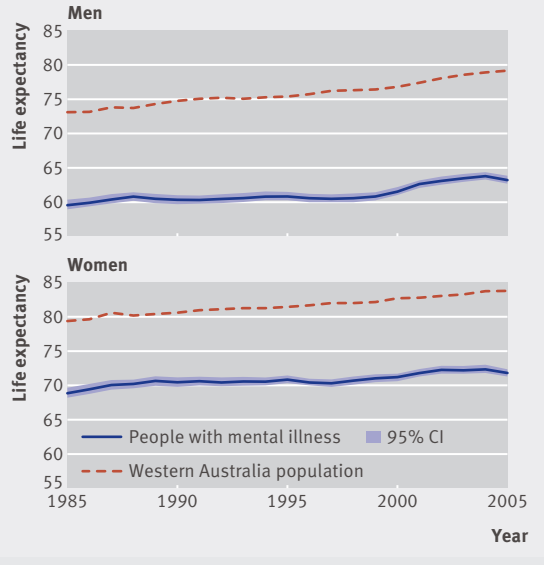
Participants and setting

Our study was based on administrative registers describing psychiatric patients and the general population of Western Australia, 1985-2005.

Design

We used a population based register of contacts with mental health services, including inpatient, outpatient, and community mental health clinics contacts. Using record linkage we calculated mortality rates of psychiatric patients and from these we calculated life expectancies.

Life expectancy of people with mental illness compared with general population of Western Australia, by year and sex



Primary outcomes

The study outcomes were life expectancy of people with mental illness, by diagnosis, from 1985 to 2005 compared with life expectancy of the general population, and the proportion of excess deaths attributed to each major cause of death.

Main results and the role of chance

In the general population, life expectancy in males increased from 73.1 years in 1985 to 79.1 years in 2005, and in females from 79.3 years to 83.8 years. In psychiatric patients, life expectancy in males increased from 59.6 years (95% confidence interval 58.8 to 60.3) to 63.2 years (62.6 to 63.7) and in females from 68.9 years (68.1 to 69.6) to 71.8 years (71.2 to 72.4). The life expectancy gap between the general population and psychiatric patients widened from 13.5 years (12.7 to 14.3) to 15.9 years (15.3 to 16.5) for males and from 10.4 years (9.6 to 11.2) to 12.0 years (11.3 to 12.6) for females between 1985 and 2005. Additionally, 77.7% of excess deaths were attributed to physical health conditions, including cardiovascular disease (29.9%) and cancer (13.5%). Suicide was the cause of only 13.9% of excess deaths.

Bias, confounding, and other reasons for caution

The study was based on administrative data relating to people in contact with mental health services. People with undiagnosed or untreated mental health problems or people only treated by general practitioners were not covered. People with mental disorders who were not in contact with services may have had different, and possibly worse, mortality outcomes. Changes in life expectancy over time could be influenced by changes in service delivery and diagnostic practices. However, as the prevalence of contact with mental health services has increased over time this would be expected to reduce, not increase, the observed gap in life expectancy.

Generalisability to other populations

Western Australia has a similar mental healthcare system to other parts of Australia, many European countries, New Zealand, and Canada. Although the generalisability of the increasing gap in life expectancy is unknown, the size of the gap and main contributing causes are likely to be similar in other locations.

Study funding/potential competing interests

This study was supported by a grant from the Griffith Institute for Health and Medical Research. The funding source had no role in the conduct of the study or its publication.

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- Research: Mental disorders and vulnerability to homicidal death (*BMJ* 2013;346:f557)
- Research: Association between psychological distress and mortality (*BMJ* 2012;345:e4933)
- Research: Mortality after hospital discharge for people with schizophrenia or bipolar disorder (*BMJ* 2011;343:d5422)

Completeness and diagnostic validity of recording acute myocardial infarction events in primary care, hospital care, disease registry, and national mortality records: cohort study

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STUDY QUESTION How do multiple linked data sources from primary care, hospital care, disease registry, and death records compare for recording of fatal and non-fatal acute myocardial infarction?

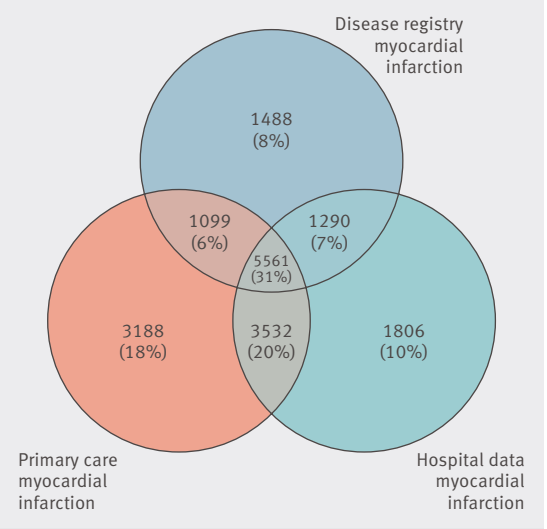
SUMMARY ANSWER Each data source missed a substantial proportion of myocardial infarction events (between 25% and 50%). This incomplete ascertainment means that incidence based on a single source is lower than using any combination of sources.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS Electronic health records are increasingly used in research for measuring outcomes of healthcare and in health policy, but no studies have addressed the completeness and validity of recording of myocardial infarction across four national health record sources. Using linked multiple sources can help to overcome the incomplete ascertainment that occurs when relying on a single data source.

Participants and setting

Our study was based on a sample of patients in England within the Clinical Practice Research Datalink who had an acute myocardial infarction recorded between 2003 and 2009 in one of four linked data sources: Clinical Practice Research Datalink (primary care data), Hospital Episode Statistics (hospital admissions), the disease registry MINAP (Myocardial Ischaemia National Audit Project), and the Office for National Statistics mortality register (cause specific mortality data).

Number and percentage of records recorded in primary care (Clinical Practice Research Datalink), hospital care (Hospital Episode Statistics), and disease registry (Myocardial Ischaemia National Audit Project) for non-fatal myocardial infarction across the three sources (n=17 964 patients)



Design, size, and duration

We identified 21 482 patients with a record of fatal or non-fatal acute myocardial infarction. Once we identified an acute myocardial infarction in any one source, we examined the remaining sources for their agreement in the diagnosis and timing of records.

Main results and the role of chance

The patients identified in each of the sources were comparable for age and sex distribution and prevalence of cardiovascular disease risk factors. 31.0% of patients with non-fatal acute myocardial infarction were identified in all of primary care, hospital admissions, and disease registry sources, and 63.9% in two or more sources. This was reflected in incidence estimates from each source, which were lower when using one source to ascertain cases than when using all sources combined. Younger, male patients with a lower rate of primary care consultations were more likely to be recorded in multiple sources. Fatal infarcts were likely to be recorded in primary care and in mortality statistics, but much less likely to be recorded in hospital admissions or the disease registry.

Bias, confounding, and other reasons for caution

These data were from a sample of 244 English general practices that consented to linkage. In terms of age and social deprivation, however, they were representative of all general practices in England. Recording standards in included practices may be higher than those in non-included practices and therefore agreement across all English practices may be lower than described.

Generalisability to other populations

These findings are relevant to all countries that record acute myocardial infarction in multiple different electronic health record sources.

Study funding/potential competing interests

This work was supported by grants from the UK National Institute for Health Research (RP-PG-0407-10314), the Wellcome Trust (086091/Z/08/Z), and UK Biobank. LS is supported by a senior clinical fellowship from the Wellcome Trust (098504). EH is supported by a Medical Research Council studentship. AS is supported by a clinical research training fellowship from the Wellcome Trust (0938/30/Z/10/Z). Clinical Practice Research Datalink is owned by the UK Department of Health and operates within the Medicines and Healthcare products Regulatory Agency. (For full details see bmj.com.)

Use of serum C reactive protein and procalcitonin concentrations in addition to symptoms and signs to predict pneumonia in patients presenting to primary care with acute cough: diagnostic study

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STUDY QUESTION Does measurement of C reactive protein (CRP) and procalcitonin help in the diagnosis of pneumonia in primary care?

SUMMARY ANSWER CRP concentration at the optimal threshold of ›30 mg/L increases diagnostic certainty in the patients in whom diagnostic doubt remains after history and physical examination, while procalcitonin adds no clinically relevant information.

WHAT IS KNOWN AND WHAT THIS PAPER ADDS There is limited evidence on the diagnostic accuracy of signs and symptoms for pneumonia that is applicable to primary care, and the usefulness of additional measurement of CRP and procalcitonin is largely unknown. A clinical rule based on symptoms and signs to predict pneumonia in patients presenting to primary care with acute cough performs best in patients with mild or severe clinical presentation. Addition of CRP at the optimal cut off of ›30 mg/L improves diagnostic certainty but measurement of procalcitonin adds no clinically relevant information.

Participants and setting

Adult patients presenting with acute cough in 16 primary care centres in 12 European countries.

Design, size, and duration

Between October 2007 and April 2010, 2820 patients had their history taken, underwent physical examination and measurement of C reactive protein (CRP) and procalcitonin in venous blood on the day they first consulted, and underwent chest radiography within seven days. Pneumonia was defined as present if the local radiologist recorded lobar or bronchopneumonia.

Main results and the role of chance

Of the 2820 patients (mean age 50, 40% men), 140 (5%) had pneumonia. The optimal combination of history and physical examination for diagnosis included absence of runny nose and presence of breathlessness, crackles and diminished breath sounds on auscultation, tachycardia, and fever, with the area under the receiver operating characteristic curve of 0.70 (95% confidence interval 0.65 to 0.75). Addition of CRP at the optimal cut off of >30 mg/L increased the area under the curve to 0.77 (0.73 to 0.81). Signs and symptoms were useful in correctly identifying patients with a "low" (<2.5%) or "high" (>20%) diagnostic risk in 26% of patients. In the 74% of patients in whom diagnostic doubt remained (estimated risk 2.5%-20%), CRP helped to correctly exclude pneumonia (net reclassification improvement 28%). A simplified diagnostic score based on symptoms, signs, and CRP resulted in pneumonia proportions of 0.7%, 4%, and 18% in the low, intermediate, and high risk group, respectively. Procalcitonin had no clinically relevant added value in this setting.

Bias, confounding, and other reasons for caution

Many more eligible patients presented during the recruitment period than were approached about participation in this study and therefore we probably did not recruit all consecutive eligible patients. Nevertheless, clinical selection bias is unlikely because feedback from recruiting clinicians during and after the study showed that recruitment of every eligible patient was impossible because of the time required to recruit and assess each patient.

CRP and procalcitonin concentrations were measured with conventional venous blood tests in a diagnostic laboratory and not a point of care test. The added value of CRP might be different if measured with a point of care test in general practice, but other studies have shown good agreement between such test results and a conventional laboratory test.

Chest radiographs were examined by local radiologists. We attempted to increase uniformity in assessment by implementing a protocol for reporting. While interobserver variability was present, the κ of 0.45 (moderate agreement) was comparable with previous studies.

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Research: Serum glucose levels for predicting death in patients admitted to hospital for community acquired pneumonia (*BMJ* 2012;344:e3397)

Comparison of diagnostic risk for pneumonia by diagnostic model with and without addition of CRP testing

Risk according to "symptoms and signs" model(without CRP)	Risk according to "symptoms and signs" model plus CRP ›30 mg/L							
	Patients with pneumonia				Patients without pneumonia			
	‹2.5%	2.5-20%	›20%	Total	‹2.5%	2.5-20%	›20%	Total
‹2.5%	4 (36)*	7 (64)	0 (0)	11	568 (87)	86 (13)	0 (0)	654
2.5-20%	27 (26)	56 (53)*	22 (21)	105	957 (48)	966 (49)	64 (3)	1987
›20%	0 (0)	5 (21)	19 (79)*	24	0 (0)	12 (31)	27 (69)	39
Total	31	68	41	140	1525	1064	91	2680

*Patients classified in agreement according to model with and without CRP ›30 mg/L. Of all patients with pneumonia, 29 (22+7+0) are reclassified to higher risk groups and 32 (27+5) to lower risk groups. For patients without pneumonia this is 150 (86+64) and 969 (957+12), respectively. Reclassification improvement is −2% among patients with pneumonia (29-32 of 140) and 30% among patients without pneumonia (957-150 of 2680), resulting in net reclassification improvement of −2+30=28% (95% CI 0.17 to 0.40).