1. BMC Cancer. 2016 Oct 10;16(1):785.

**Risk factors for cancer development in type 2 diabetes: A retrospective case-control study.**

Dąbrowski M, Szymańska-Garbacz E, Miszczyszyn Z, Dereziński T, Czupryniak L

Author information: Faculty of Medicine, Institute of Nursing and Health Sciences, University of Rzeszow, Poland.

BACKGROUND: The risk of several types of cancer is increased in type 2 diabetes

mellitus. The earliest possible diagnosis of cancer - difficult within regular

outpatient diabetes care - is of utmost importance for patients' survival. The

aim of this multicenter, retrospective (years 1998-2015), case-control study was

to identify risk factors associated with malignancy in subjects with diabetes

treated in a typical outpatient setting.

METHODS: In the databases of 3 diabetic and 1 primary care clinics 203 patients

(115 women) with type 2 diabetes mellitus who developed malignancy while treated

for diabetes were identified. The control group consisted of 203 strictly age-

and gender matched subjects with type 2 diabetes without cancer. Factors

associated with diabetes: disease duration, antidiabetic medications use and

metabolic control of diabetes were analyzed. Also other variables: BMI (body mass

index), smoking habits, place of residence and comorbidities were included into

analysis.

RESULTS: The most prevalent malignancies in men and women together were breast

cancer (20.7 %) and colorectal cancer (16.3 %). HbA1c (hemoglobin A1c) level

≥8.5 %, obesity and insulin treatment in dose-dependent and time-varying manner

demonstrated significant association with increased risk of malignancy, while

metformin use was associated with a lower risk of cancer. Diabetes duration,

comorbidities, smoking habits, place of residence and aspirin use did not show

significant association with risk of malignancy.

CONCLUSIONS: In the outpatient setting the obese patients with poorly controlled

insulin treated type 2 diabetes mellitus should be rigorously assessed towards

malignancies, particularly breast cancer in women and colorectal cancer in men. PMID: 27724912

2. Eur J Intern Med. 2016 Oct;34:89-93.

**Metabolic syndrome, obesity, and the risk of cancer development.**

Bitzur R, Brenner R, Maor E, Antebi M, Ziv-Baran T, Segev S

Author information: The Bert W. Strassburger Lipid Center, Sheba Medical Center, Israel

BACKGROUND: Metabolic syndrome and its components are severe global health issues

that are increasing in frequency as the prevalence of obesity increases. Various

studies have established a correlation between metabolic syndrome and diseases

including, diabetes mellitus, non-alcoholic fatty liver disease, cirrhosis, and

cardiovascular disease. In recent years, correlations have also been detected

between obesity and metabolic syndrome and the prevalence of certain types of

cancer. The current study examines whether obesity and metabolic syndrome

components are risk factors for cancer among the adult population in Israel.

METHODS: A cohort study analysis was performed of 24,987 initially healthy men

and women who underwent yearly medical assessments at the Institute for Medical

Screening in the Sheba Medical Center. Data from the Institute for Medical

Screening database was correlated with that from the Israel Cancer Center in the

Ministry of Health updated to December 2013. The correlation between metabolic

syndrome, obesity, and the overall risk of cancer as well as the risks of

specific types of cancer were examined.

RESULTS: Of 20,444 subjects for whom complete data were available, 1535 were

diagnosed with cancer during the mean follow-up time of 104.3months. In a

multi-variant analysis, no significant correlation was found between metabolic

syndrome or obesity and the incidence of cancer. When the data were stratified by

gender and cancer type, however, a significant association between metabolic

syndrome and breast cancer in women was observed (P=0.03, HR=1.67, 95%

CI=1.05-2.67).

CONCLUSION: Metabolic syndrome correlates with higher than expected breast cancer

incidence in women. PMID: 27545645

3. Oncologist. 2015 Nov;20(11):1236-44.

**Metformin Use Is Associated With Better Survival of Breast Cancer Patients With Diabetes: A Meta-Analysis.**

Xu H, Chen K, Jia X, Tian Y, Dai Y, Li D, Xie J, Tao M

Author information: Department of Oncology, First Affiliated Hospital of Soochow University, People's Republic of China.

BACKGROUND: Diabetic patients with breast cancer receiving metformin and

neoadjuvant chemotherapy have a higher pathologic complete response rate than do

diabetic patients not receiving metformin, but findings on salvage treatment have

been inconsistent. We performed a meta-analysis to assess the effect of adding

metformin to standard therapy on the prognosis of breast cancer patients with

diabetes.

METHODS: We searched PubMed, Embase, Web of Science (Thomson Scientific), China

Knowledge Resource Integrated Database, VIP journal integration platform, and

Chinese BioMedical Literature Database from inception to January 10, 2015,

without language restrictions, including references related to metformin, breast

cancer, and prognosis. We performed the meta-analysis using a random-effects

model, with hazard ratios (HRs) and 95% confidence intervals (95% CIs) as effect

measures.

RESULTS: A total of 11 studies consisting of 5,464 breast cancer patients with

diabetes were included, comprising 2,760 patients who had received metformin and

2,704 patients who had not. The meta-analysis showed that metformin was

associated with better overall survival times (HR: 0.53; 95% CI: 0.39-0.71) and

cancer-specific survival times (HR: 0.89; 95% CI: 0.79-1.00). Subgroup analysis

revealed that metformin improved the overall survival by 65% after adjusting for

hormone receptor expression (HR: 0.35; 95% CI: 0.15-0.84). Taking metformin after

the diagnosis of breast cancer was still associated with prolonged overall

survival.

CONCLUSION: The use of metformin in standard cancer therapy might improve both

overall and cancer-specific survivals of diabetic patients with breast cancer.

IMPLICATIONS FOR PRACTICE: Diabetic patients with breast cancer receiving

metformin and neoadjuvant chemotherapy have a higher pathologic complete response

rate than diabetic patients not receiving metformin, but findings on salvage

treatment have been inconsistent. The meta-analysis showed that metformin was

associated with better overall survival times and cancer-specific survival times.

Subgroup analysis revealed that metformin improved the overall survival by 65%

after adjusting for hormone receptor expression. Taking metformin after the

diagnosis of breast cancer was still associated with prolonged overall survival.

The findings of this study highlight the potential usage of metformin in diabetic

patients with breast cancer. PMID: 26446233

4. Br J Cancer. 2015 Sep 1;113(5):827-32.

**Pre-existing diabetes and breast cancer prognosis among elderly women.**

Luo J, Hendryx M, Virnig B, Wen S, Chlebowski R, Chen C, Rohan

Author information: Department of Epidemiology and Biostatistics, School of Public Health, Indiana University Bloomington, IN

BACKGROUND: The objective of this study was to assess the impact of pre-existing

diabetes on breast cancer prognosis.

METHODS: Women (n=2833) with centrally confirmed invasive breast cancer in the

Women's Health Initiative, who were linked to Medicare claims data (CMS) were

followed from the date of breast cancer diagnosis to date of death or 20

September 2013. Information on diabetes was identified through the CMS Chronic

Condition Warehouse algorithm. Cox proportional hazard regression was used to

estimate adjusted hazard ratios for overall mortality. A competing risks model

(proportional subdistribution) model was used to estimate hazard ratios for

breast cancer-specific mortality.

RESULTS: Women with diabetes were more likely to have factors related to delayed

diagnosis (less recent mammograms, and more advanced cancer stage) and were less

likely to receive radiation therapy. Compared with women without diabetes, women

with diabetes had significantly increased risk of overall mortality (HR=1.57, 95%

CI: 1.23-2.01) and had nonsignificantly increased risk for breast cancer-specific

mortality (HR=1.36, 95% CI: 0.86-2.15) before adjustment for factors related to

delayed diagnosis and treatment. Adjustment for these factors resulted in a

little change in the association of diabetes with overall mortality risk, but

further attenuated the point estimate for breast cancer-specific mortality.

CONCLUSIONS: Our study provides additional evidence that pre-existing diabetes

increases the risk of total mortality among women with breast cancer. Very large

studies with data on breast cancer risk factors, screening and diagnostic delays,

treatment choices, and the biological influence of diabetes on breast cancer will

be needed to determine whether diabetes also increases the risk for breast

cancer-specific mortality. PMID: 26158425

5. Panminerva Med. 2015 Sep;57(3):101-8.

**Diabetes mellitus is associated with breast cancer: systematic review, meta-analysis, and in silico reproduction.**

Zhou Y, Zhang X, Gu C, Xia J.

Author information: Department of General Surgery and Translational Medicine Center, Nanjing Medical University, Affiliated Wuxi Second Hospital, Wuxi, Jiangsu, China

AIM: Breast cancer (BrCa) and diabetes mellitus (DM) are two major heath problems

in women and the general population. This study explores the association between

DM and breast cancer patients' survival outcomes, as well as the potential

therapeutic merits of metformin.

METHODS: To explore the association between DM and BrCa, we performed systematic

literature search in EMBASE (www.embase.com) and MEDLINE

(www.ncbi.nlm.nih.gov/pubmed) from January 1960 to April 2014 and systematically

identified clinical studies that assessed the association between BrCa mortality

and DM. The NCBI Gene Expression Omnibus (GEO) database was analyzed to identify

micro-RNA change in BrCa cells treated by metformin, a common drug for DM

worldwide.

RESULTS: Twenty studies were selected for the meta-analysis, of which 16 reported

all-cause mortality and 12 reported cancer specific death. During our inclusion

period, the cohorts encompassed a total of 2,645,249 patients including more than

207,832 DM patients. Pre-existing DM was associated with a 37% increase of

all-cause mortality risk for women with BrCa (HR=1.37; 95%CI: 1.34-1.41; P=0.02).

DM was in general associated with a 17% increased risk for BrCa mortality in

women (HR=1.17; 95%CI: 1.11-1.22; P<0.01). The GEO analysis revealed

downregulation of a series of pro-tumorigenic micro-RNAs following metformin

treatment, which was in part restored by DICER knockdown.

CONCLUSION: Women with DM are at higher risk of BrCa-specific and all-cause

mortality after initial breast cancer diagnosis. BrCa patients with DM could

possibly benefit from metformin treatment via DICER mediation. PMID: 25971328

6. Cancer Causes Control. 2015 Aug;26(8):1065-77.

**Associations between diabetes medication use and risk of second breast cancer events and mortality.**

Calip GS, Yu O, Hoskins KF, Boudreau DM.

Author information: Center for Pharmacoepidemiology and Pharmacoeconomic Research, University of

Illinois at Chicago, Chicago, IL

PURPOSE: Diabetes and certain diabetes medications have been shown to influence

breast cancer (BC) risk. Less is known about their relation to BC outcomes. Our

objective was to evaluate the effects of diabetes and diabetes medications on

risk of second breast cancer events (SBCE) and mortality.

METHODS: This population-based cohort study was conducted among women diagnosed

with early-stage (I-II) BC and enrolled in an integrated health plan. Exposures

of interest were diabetes and medication classes including insulin, metformin,

and sulfonylureas. Outcomes of interest were SBCE defined as recurrence or second

primary BC, BC-specific mortality, and all-cause mortality. We used multivariable

Cox proportional hazards models to estimate hazard ratios (HR) and 95 %

confidence intervals (CI) for diabetes and medication use while accounting for

potential confounders and competing risks.

RESULTS: Among 4,216 women, 13 % developed SBCE during a median follow-up of

6.3 years. 610 women had diabetes of which 76 % used oral diabetes medication

and/or insulin. Findings suggested that diabetes increased the risk of recurrence

(HR = 1.57; 95 % CI 1.09-2.25) but not overall SBCE (HR = 1.29; 95 % CI

0.94-1.76) or second primary BC (HR = 0.74; 95 % CI 0.39-1.41). Among women with

diabetes, insulin use was associated with increased risks of recurrence

(HR = 1.94; 95 % CI 1.08-3.48) and all-cause mortality (HR = 2.33; 95 % CI

1.70-3.20). Metformin use was associated with lower all-cause mortality

(HR = 0.55; 95 % CI 0.38-0.79).

CONCLUSIONS: Our findings show an association between diabetes and increased

recurrence risk, and risk may be greater among insulin users. Metformin may

reduce all-cause mortality among BC survivors. Given the growing breast cancer

survivor population, further research in larger, more diverse populations is

warranted. PMID: 25956271

7. Breast Cancer Res. 2015 May 3;17:64.

**Metformin increases survival in hormone receptor-positive, HER2-positive breast cancer patients with diabetes.**

Kim HJ, Kwon H, Lee JW, Kim HJ, Lee SB, Park HS, Sohn G

Author information: Division of Breast and Endocrine Surgery, Department of Surgery, Asan Medical

Center, University of Ulsan College of Medicine, Seoul, Korea.

INTRODUCTION: Metformin use has recently been observed to decrease both the rate

and mortality of breast cancer. Our study was aim to determine whether metformin

use is associated with survival in diabetic breast cancer patients by breast

cancer subtype and systemic treatment.

METHODS: Data from the Asan Medical Center Breast Cancer Database from 1997 to

2007 were analyzed. The study cohort comprised 6,967 nondiabetic patients, 202

diabetic patients treated with metformin, and 184 diabetic patients that did not

receive metformin. Patients who were divided into three groups by diabetes status

and metformin use were also divided into four subgroups by hormone receptor and

HER2-neu status.

RESULTS: In Kaplan-Meier analysis, the metformin group had a significantly better

overall and cancer specific survival outcome compared with non metformin diabetic

group (P <0.005 for both). There was no difference in survival between the

nondiabetic and metformin groups. In multivariate analysis, Compared with

metformin group, patients who did not receive metformin tended to have a higher

risk of metastasis with HR 5.37 (95 % CI, 1.88 to 15.28) and breast cancer death

with HR 6.51 (95 % CI, 1.88 to 15.28) on the hormone receptor-positive and

HER2-negative breast cancer. The significant survival benefit of metformin

observed in diabetic patients who received chemotherapy and endocrine therapy (HR

for disease free survival 2.14; 95 % CI 1.14 to 4.04) was not seen in diabetic

patients who did not receive these treatments.

CONCLUSION: Patients receiving metformin treatment when breast cancer diagnosis

show a better prognosis only if they have hormone receptor-positive,

HER2-positive tumors. Metformin treatment might provide a survival benefit when

added to systemic therapy in diabetic patients. PMID: 25935404

8. Breast Cancer Res Treat. 2015 Apr;150(3):613-20.

**The association between diabetes and breast cancer stage at diagnosis: apopulation-based study.**

Lipscombe LL, Fischer HD, Austin PC, Fu L, Jaakkimainen RL, Ginsburg O, Rochon

Author information: Women's College Research Institute, Women's College Hospital, Toronto, ON, Canada

Women with diabetes have higher breast cancer incidence and mortality. The

purpose of this study was to examine the impact of diabetes on stage at breast

cancer diagnosis, as a possible reason for their higher mortality. Using

population-based health databases from Ontario, Canada, this retrospective cohort

study examined stage at diagnosis (II, III, or IV vs I) among women aged 20-105

years who were newly diagnosed with invasive breast cancer between 2007 and 2012.

We compared those with diabetes to those without diabetes. Diabetes was defined

based on medical records using a validated algorithm. Among 38,407 women with

breast cancer, 6115 (15.9 %) women had diabetes. Breast cancer patients with

diabetes were significantly more likely to present with advanced-stage breast

cancer than those without diabetes. After adjustment for mammograms and other

covariates, diabetes was associated with a significantly increased risk of Stage

II [adjusted odds ratio (aOR) 1.14, 95 % confidence interval (CI) 1.07, 1.22],

Stage III (aOR 1.21, 95 % CI 1.11, 1.33), and Stage IV (aOR 1.16, 95 % CI 1.01,

1.33) versus Stage I breast cancer. Women with diabetes had a higher risk of

lymph node metastases (aOR 1.16, 95 % CI 1.06, 1.27) and tumors with size over 2

cm (aOR 1.16, 95 % CI 1.06, 1.28). Diabetes was associated with more

advanced-stage breast cancer, even after accounting for differences in screening

mammogram use and other factors. Our findings suggest that diabetes may

predispose to more aggressive breast cancer, which may be a contributor to their

higher cancer mortality. PMID: 25779100

9. Breast Cancer Res Treat. 2015 Apr;150(2):427-37.

**The association between glucose-lowering drug use and mortality among breast cancer patients with type 2 diabetes.**

Vissers PA, Cardwell CR, van de Poll-Franse LV, Young IS, Pouwer F, Murray LJ.

Author information: CoRPS-Center of Research on Psychology in Somatic Diseases, Department of

Medical and Clinical Psychology, Tilburg University, The Netherlands

This study assessed the association between glucose-lowering drug (GLD) use,

including metformin, sulphonylurea derivatives and insulin, after breast cancer

diagnosis and breast cancer-specific and all-cause mortality. 1763 breast cancer

patients, diagnosed between 1998 and 2010, with type 2 diabetes were included.

Cancer information was retrieved from English cancer registries, prescription

data from the UK Clinical Practice Research Datalink and mortality data from the

Office of National Statistics (up to January 2012). Time-varying Cox regression

models were used to calculate HRs and 95 % CIs for the association between GLD

use and breast cancer-specific and all-cause mortality. In 1057 patients with

diabetes before breast cancer, there was some evidence that breast

cancer-specific mortality decreased with each year of metformin use (adjusted HR

0.88; 95 % CI 0.75-1.04), with a strong association seen with over 2 years of use

(adjusted HR 0.47; 95 % CI 0.26-0.82). Sulphonylurea derivative use for less than

2 years was associated with increased breast cancer-specific mortality (adjusted

HR 1.70; 95 % CI 1.18-2.46), but longer use was not (adjusted HR 0.94; 95 % CI

0.54-1.66). In 706 patients who developed diabetes after breast cancer, similar

patterns were seen for metformin, but sulphonylurea derivative use was strongly

associated with cancer-specific mortality (adjusted HR 3.64; 95 % CI 2.16-6.16),

with similar estimates for short- and long-term users. This study provides some

support for an inverse association between, mainly long-term, metformin use and

(breast cancer-specific) mortality. In addition, sulphonylurea derivative use was

associated with increased breast cancer-specific mortality, but this should be

interpreted cautiously, as it could reflect selective prescribing in advanced

cancer patients. PMID: 25762476

10. Cancer Epidemiol Biomarkers Prev. 2015 Feb;24(2):361-8.

**Diabetes and other comorbidities in breast cancer survival by race/ethnicity: the California Breast Cancer Survivorship Consortium (CBCSC).** Wu AH, Kurian AW, Kwan ML, John EM, Lu Y, Keegan TH, Gomez

Author information: Keck School of Medicine, University of Southern California, Los Angeles

BACKGROUND: The role of comorbidities in survival of patients with breast cancer

has not been well studied, particularly in non-white populations.

METHODS: We investigated the association of specific comorbidities with mortality

in a multiethnic cohort of 8,952 breast cancer cases within the California Breast

Cancer Survivorship Consortium (CBCSC), which pooled questionnaire and cancer

registry data from five California-based studies. In total, 2,187 deaths (1,122

from breast cancer) were observed through December 31, 2010. Using multivariable

Cox proportional hazards regression, we estimated HRs and 95% confidence

intervals (CI) for overall and breast cancer-specific mortality associated with

previous cancer, diabetes, high blood pressure (HBP), and myocardial infarction.

RESULTS: Risk of breast cancer-specific mortality increased among breast cancer

cases with a history of diabetes (HR, 1.48; 95% CI, 1.18-1.87) or myocardial

infarction (HR, 1.94; 95% CI, 1.27-2.97). Risk patterns were similar across

race/ethnicity (non-Latina white, Latina, African American, and Asian American),

body size, menopausal status, and stage at diagnosis. In subgroup analyses, risk

of breast cancer-specific mortality was significantly elevated among cases with

diabetes who received neither radiotherapy nor chemotherapy (HR, 2.11; 95% CI,

1.32-3.36); no increased risk was observed among those who received both

treatments (HR, 1.13; 95% CI, 0.70-1.84; P(interaction) = 0.03). A similar

pattern was found for myocardial infarction by radiotherapy and chemotherapy

(P(interaction) = 0.09).

CONCLUSION: These results may inform future treatment guidelines for patients

with breast cancer with a history of diabetes or myocardial infarction.

IMPACT: Given the growing number of breast cancer survivors worldwide, we need to

better understand how comorbidities may adversely affect treatment decisions and

ultimately outcome. PMID: 25425578

11. Nutr Cancer. 2015;67(2):197-202.

**A review of obesity, insulin resistance, and the role of exercise in breast cancer patients.**

Ghose A, Kundu R, Toumeh A, Hornbeck C, Mohamed I.

Author information: Department of Hematology/Oncology , University of Cincinnati , Cincinnati , Ohio

Breast cancer, the most common female malignancy in the world, has a strong

association with obesity and insulin resistance. The importance of these risk

factors goes up significantly in patients already affected by this cancer as they

negatively affect the prognosis, recurrence rate, and survival by various

mechanisms. The literature on the role of physical activity and aerobic exercise

on modifying the above risks is debatable with data both for and against it. In

this article, we have reviewed the risks of obesity and insulin resistance in

breast cancer patients and the controversy associated with the impact of

exercise. Ultimately, we have concluded that a randomized control trial is

necessary with an individualized aerobic exercise program for a minimum duration

of 20 wk on breast cancer patients, who are undergoing or recently completed

chemotherapy, to study its effects on insulin resistance, weight, and clinical

outcome. PMID: 25625592

12. Breast Cancer Res Treat. 2014 Nov;148(2):363-77.

**Metabolic syndrome and outcomes following early-stage breast cancer.**

Calip GS, Malone KE, Gralow JR, Stergachis A, Hubbard RA, Boudreau DM.

Author information: Center for Pharmacoepidemiology and Pharmacoeconomic Research, University of Illinois at Chicago, IL

The prevalence of risk factors contributing to metabolic syndrome (MetS) is

increasing, and numerous components of MetS are associated with increased primary

breast cancer (BC) risk. However, less is known about the relationship of MetS to

BC outcomes. The aim of this study was to evaluate whether MetS, characterized by

increased weight, hypertension, low HDL-cholesterol, high triglycerides, and

diabetes or impaired glucose tolerance, is associated with risk of second breast

cancer events (SBCE) and BC-specific mortality. Retrospective cohort study of

women diagnosed with incident early-stage (I-II) BC between 1990 and 2008,

enrolled in an integrated health plan. Outcomes of interest were SBCE, defined as

recurrence or second primary BC, and BC-specific mortality. We used multivariable

Cox proportional hazards models to estimate adjusted hazard ratios (HR) and 95%

confidence intervals (CI) for time-varying exposure to MetS components while

accounting for potential confounders and competing risks. Among 4,216 women in

the cohort, 26% had ≥3 MetS components and 13% developed SBCE during median

follow-up of 6.3 years. Compared to women with no MetS components, presence of

MetS (≥3 components) was associated with increased risk of SBCE (HR = 1.50, 95%

CI 1.08-2.07) and BC-specific mortality (HR = 1.65, 95% CI 1.02-2.69). Of the

individual components, only increased weight was associated with increased risk

of SBCE (HR = 1.26, 95% CI 1.06-1.49). MetS is associated with modestly increased

risk of SBCE and BC-specific mortality. Given the growing population of BC

survivors, further research in larger and more diverse populations is warranted. PMID: 25301086

13. Breast Cancer Res Treat. 2014 Nov;148(1):153-62.

**Diabetes, diabetes treatment and breast cancer prognosis.**

Luo J, Virnig B, Hendryx M, Wen S, Chelebowski R, Chen C, Rohan T, Tinker L

Author information: Department of Epidemiology and Biostatistics, School of Public Health, Indiana University, Bloomington, IN

The objectives of this study are to assess the impact of pre-existing diabetes

and diabetes treatment on breast cancer prognosis. 8,108 women with centrally

confirmed invasive breast cancer in the Women's Health Initiative diagnosed

between 1998 and 2013 were followed through the date of death or September 20,

2013. Information on diabetes and diabetes therapy were obtained via self-report

and face-to-face review of current medication containers, respectively. Cox

proportional hazard regression was used to estimate adjusted relative hazard

ratios for overall mortality. The proportional subdistribution hazard model was

used to estimate hazard ratios for breast cancer-specific mortality. Compared

with women without diabetes, women with diabetes had significantly increased risk

of overall mortality (HR 1.26 95 % CI 1.06-1.48), especially among those who took

insulin or had longer duration of diabetes. However, diabetes was not associated

with increased risk of breast cancer-specific mortality, regardless of type of

treatment and duration of diabetes, despite the significant association of

diabetes with unfavorable tumor characteristics. Our large prospective cohort

study provides additional evidence that pre-existing diabetes increases risk of

total mortality among women with breast cancer. The increased total mortality

associated with diabetes was mainly driven by increased risk of dying from

diseases other than breast cancer. Thus, the continuum of care for breast cancer

patients with diabetes should include careful attention to CVD risk factors and

other non-cancer conditions. PMID: 25261292

14. Breast Cancer Res Treat. 2014 Aug;147(1):159-65.

**Metabolic syndrome and breast cancer prognosis.** Berrino F, Villarini A Traina A, Bonanni B, Panico S, Mano MP

Author information: Epidemiology & Prevention Unit, Department of Preventive & Predictive Medicine, Fondazione IRCCS Istituto Nazionale dei Tumori, Milan, Italy.

Metabolic syndrome (MS), conventionally defined by the presence of at least three

out of five dysmetabolic traits (abdominal obesity, hypertension, low plasma

HDL-cholesterol, high plasma glucose and high triglycerides), has been associated

with an increased risk of several age-related chronic diseases, including breast

cancer (BC). This may have prognostic implications for BC survivors. 2,092 early

stage BC survivors aged 35-70, recruited in eleven Italian centres 0-5 years

after surgical treatment (1.74 years on average), were followed-up over 2.8 years

on average for additional BC-related events, including BC-specific mortality,

distant metastasis, local recurrences and contralateral BC. At recruitment, 20 %

of the patients had MS. Logistic regression models were carried out to generate

OR and 95 % confidence intervals (CI) for new BC events associated with MS,

adjusting for baseline pathological prognostic factors. New BC events occurred in

164 patients, including 89 distant metastases. The adjusted ORs for women with MS

versus women without any MS traits were 2.17 (CI 1.31-3.60) overall, and 2.45 (CI

1.24-4.82) for distant metastasis. The OR of new BC events for women with only

one or two MS traits was 1.40 (CI 0.91-2.16). All MS traits were positively

associated with new BC events, and significantly so for low HDL and high

triglycerides. MS is an important prognostic factor in BC. As MS is reversible

through lifestyle changes, interventions to decrease MS traits in BC patients

should be implemented in BC clinics. PMID: 25104441

15. Cancer Med. 2014 Aug;3(4):1025-34.

**The effect of metformin on breast cancer outcomes in patients with type 2 diabetes.**

Oppong BA, Pharmer LA, Oskar S, Eaton A, Stempel M, Patil S, King TA.

Author information: Breast Service, Department of Surgery, Memorial Sloan Kettering Cancer Center, New York

Observational data suggest that metformin use decreases breast cancer (BC)

incidence in women with diabetes; the impact of metformin on BC outcomes in this

population is less clear. The purpose of this analysis was to explore whether

metformin use influences BC outcomes in women with type 2 diabetes. Prospective

institutional databases were reviewed to identify patients with diabetes who

received chemotherapy for stages I-III BC from 2000 to 2005. Patients diagnosed

with diabetes before or within 6 months of BC diagnosis were included. Males and

those with type I, gestational, or steroid-induced diabetes were excluded.

Patients were stratified based on metformin use, at baseline, defined as use at

time of BC diagnosis or at diabetes diagnosis if within 6 months of BC diagnosis.

Kaplan-Meier methods were used to estimate rates of recurrence-free survival

(RFS), overall survival (OS), and contralateral breast cancer (CBC). We

identified 313 patients with diabetes who received chemotherapy for BC, 141 (45%)

fulfilled inclusion criteria and 76 (54%) used metformin at baseline. There were

no differences in clinical presentation or tumor characteristics between

metformin users and nonusers. At a median follow-up of 87 months (range,

6.9-140.4 months), there was no difference in RFS (P = 0.61), OS (P = 0.462), or

CBC (P = 0.156) based on metformin use. Five-year RFS was 90.4% (95% CI, 84-97)

in metformin users and 85.4% (95% CI, 78-94) in nonusers. In this cohort of

patients with type 2 diabetes receiving systemic chemotherapy for invasive BC,

the use of metformin was not associated with improved outcomes. PMID: 24944108

16. Diabetes Obes Metab. 2014 Aug;16(8):707-10.

**The prognostic value of metformin for cancer patients with concurrent diabetes: a systematic review and meta-analysis.** Zhang ZJ, Li S.

Author information: Department of Epidemiology and Biostatistics, School of Public Health, Wuhan University, China.

AIM: Emerging evidence from epidemiologic studies and basic science suggests a

potential antitumour effect of metformin. However, whether metformin improves

survival in cancer patients remains inconclusive.

METHODS: A literature search was performed using the PubMed, EMbase and SciVerse

Scopus databases. Pooled effect estimates were derived using a random-effects

meta-analysis model.

RESULTS: Of the 28 studies retrieved, the pooled effect estimates showed that

metformin was associated with lower risk of all-cause mortality in cancer

patients with concurrent diabetes, particularly for breast [pooled relative risk

(RR) 0.70, 95% CI 0.55, 0.88; p = 0.003], colorectal (RR 0.70, 95% CI 0.59, 0.84;

p < 0.001), ovarian (RR 0.44, 95% CI 0.30, 0.64; p < 0.001) and endometrial

cancer (RR 0.49, 95% CI 0.32, 0.73; p = 0.001). In addition, metformin was

associated with lower risks of cancer-specific mortality.

CONCLUSIONS: The findings of this study support the hypothesis that metformin

improves the survival for cancer patients with concurrent diabetes, particularly

for breast, colorectal, ovarian, and endometrial cancer. Further investigation is

warranted. PMID: 24460896

17. Breast Cancer Res Treat. 2014 Jul;146(1):189-97.

**Body mass index, diabetes, and triple-negative breast cancer prognosis.** Tait S, Pacheco JM, Gao F, Bumb C, Ellis MJ

Author information: Department of Biology, University of Virginia, Charlottesville, VA

Higher body mass index (BMI) and diabetes are associated with worse breast cancer

prognosis. However, few studies have focused on triple-negative breast cancer

(TNBC). The goal of this study is to examine this association in a cohort of

patients with TNBC. We retrospectively reviewed 501 consecutive patients with

TNBC seen at the Washington University Breast Oncology Clinic. Cox proportional

hazard models were used to determine the relationship between BMI and diabetes at

diagnosis with overall survival (OS) and disease free survival (DFS). Four

hundred and forty-eight patients had BMI recorded and 71 patients had diabetes.

The median age at diagnosis was 53 (23-98) years and follow-up was 40.1 months

(IQR 25.2-62.9). Baseline BMI and diabetes were not associated with OS or DFS. OS

hazard ratios (HRs) for patients who were overweight (BMI 25.0-29.99), with class

I obesity (BMI 30-34.99), or BMI ≥35 were 1.22 (CI 0.78-1.91), 0.92 (CI

0.59-1.43), and 1.16 (CI 0.70-1.90), respectively. The HRs for DFS in patients

who were overweight, with class I obesity, or BMI ≥35 were 1.01 (CI 0.65-1.56),

0.94 (CI 0.60-1.47), and 0.99 (CI 0.63-1.57), respectively. Similarly, the HRs

for diabetics were 1.27 (CI 0.82-1.96) for OS and 0.98 (CI 0.64-1.51) for DFS.

Obesity and diabetes did not significantly affect survival for patients with TNBC

in this study. PMID: 24869799

18. Breast Cancer Res Treat. 2014 Feb;143(3):551-70.

**Treatment and outcomes in diabetic breast cancer patients.** Gold HT, Makarem N, Nicholson JM, Parekh N.

Author information: Department of Population Heath, New York University School of Medicine

Effective breast cancer management is more complex with diabetes present and may

contribute to poor outcomes. Therefore, we conducted two simultaneous systematic

reviews to address the association of diabetes with (1) treatment patterns in

breast cancer patients and (2) breast cancer recurrence rates or breast

cancer-specific and all-cause mortality. We searched major databases for English

language peer-reviewed studies through November 2013, which addressed either of

the above research questions, following the preferred reporting items for

systematic reviews and meta-analyses (PRISMA) method. Analyses compared treatment

patterns or health outcomes for breast cancer subjects with and without diabetes.

We used STROBE quality criteria and conducted a random-effects meta-analysis of

all-cause mortality. The review yielded 11 publications for question 1 and 26 for

question 2, with nine overlapping. Treatment studies showed chemotherapy was less

likely in patients with diabetes. Of 22 studies, 21 assessing all-cause mortality

indicated a statistically significant increased overall mortality for patients

with diabetes (hazard ratios: 0.33-5.40), with meta-analysis of eligible studies

indicating a 52 % increased risk. Nine studies assessing breast cancer-specific

mortality had inconsistent results, with five showing significantly increased

risk for diabetes patients. Results were inconsistent for recurrence and

metastases. The majority of studies reported detrimental associations between

diabetes and optimal treatment or all-cause mortality among women with breast

cancer. Divergence in variable and outcomes inclusion and definitions, potential

participation bias in individual studies, and differing analytic methods make

inferences difficult. This review illuminates the importance of the impact of

diabetes on breast cancer patients and explicitly recognizes that co-management

of conditions is necessary to prevent excess morbidity and mortality. PMID: 24442643

19. Pathol Oncol Res. 2014 Jan;20(1):209-14.

**The impact of diabetes mellitus on breast cancer outcomes: a single center retrospective study.**

Yerrabothala S, Shaaban H, Capo G, Maroules M, Debari VA.

Author information: Trinitas Regional Medical Center, Seton Hall University School of Health and Medical Sciences

Diabetes mellitus has been implicated to affect the prognostic outcomes of

patients with various types of cancer. This study explores the impact of diabetes

mellitus on the survival outcomes of patients with all stages of breast cancer.

We performed a retrospective analysis of 255 patients with all stages of breast

cancer. Survival outcomes were compared for diabetic and non-diabetic patients. A

greater percent of patients in the non-diabetic group (54.1%) presented with

early-stage (stage 0 and 1) cancer than diabetics for which 41.2% presented with

stage 0 or 1 breast cancer; however this difference did not achieve statistical

significance (p = 0.068). Overall, we observed a significant difference in

survival between the diabetics and non-diabetic subjects (p = 0.001). Even after

adjustment for all covariates and after stratification for Body Mass Index (BMI),

diabetics were found to have a poorer prognosis in terms of survival time. In

patients with breast cancer, diabetes mellitus is an independent predictor of

lower overall survival rates, even after adjusting for other comorbidities.

Primary caregivers and oncologists alike should aggressively screen breast cancer

patients for diabetes mellitus and vice versa. PMID: 23832821

20. Ann Oncol. 2013 Dec;24(12):3011-6.

**Diabetes in relation to breast cancer relapse and all-cause mortality in elderly breast cancer patients: a FOCUS study analysis.** Kiderlen M, de Glas NA, Bastiaannet E, Engels CC, van de Water W, de Craen A

Author information: Department of Surgery, Leiden University Medical Center, Leiden.

BACKGROUND: In developed countries, 40% of breast cancer patients are >65 years

of age at diagnosis, of whom 16% additionally suffer from diabetes. The aim of

this study was to assess the impact of diabetes on relapse-free period (RFP) and

overall mortality in elderly breast cancer patients.

PATIENTS AND METHODS: Patients were selected from the retrospective FOCUS cohort,

which contains detailed information of elderly breast cancer patients. RFP was

calculated using Fine and Gray competing risk regression models for patients with

diabetes versus patients without diabetes. Overall survival was calculated by Cox

regression models, in which patients were divided into four groups: no

comorbidity, diabetes only, diabetes and other comorbidity or other comorbidity

without diabetes.

RESULTS: Overall, 3124 patients with non-metastasized breast cancer were

included. RFP was better for patients with diabetes compared with patients

without diabetes (multivariable HR 0.77, 95% CI 0.59-1.01), irrespective of other

comorbidity and most evident in patients aged ≥75 years (HR 0.67, 95% CI

0.45-0.98). The overall survival was similar for patients with diabetes only

compared with patients without comorbidity (HR 0.86, 95% CI 0.45-0.98), while

patients with diabetes and additional comorbidity had the worst overall survival

(HR 1.70, 95% CI 1.44-2.01).

CONCLUSION: When taking competing mortality into account, RFP was better in

elderly breast cancer patients with diabetes compared with patients without

diabetes. Moreover, patients with diabetes without other comorbidity had a

similar overall survival as patients without any comorbidity. Possibly,

unfavourable effects of (complications of) diabetes on overall survival are

counterbalanced by beneficial effects of metformin on the occurrence of breast

cancer recurrences. PMID: 24026538

21. Curr Drug Saf. 2013 Nov;8(5):357-63.

**Use of metformin and survival of diabetic women with breast cancer.**

Peeters PJ, Bazelier MT, Vestergaard P, Leufkens HG, Schmidt MK, de Vries F

Author information: Department of Pharmacoepidemiology and Clinical Pharmacology, Utrecht Institute of Pharmaceutical Sciences, Utrecht University, The Netherlands.

OBJECTIVE: This study was set out to determine whether metformin use influences

survival in breast cancer patients treated with antidiabetic drugs as compared to

non-users.

RESEARCH DESIGN AND METHODS: We used data from the Danish national registries

(1996-2008) to identify adult female patients diagnosed with breast cancer who

were prescribed antidiabetic medication. We performed multivariate

Coxproportional hazard regression to assess all-cause and breast cancer-specific

mortality risks associated with metformin exposure. In a secondary analysis, we

stratified use of metformin according to the cumulative number of prescriptions.

RESULTS: Of the 1058 breast cancer patients 349 died during follow-up, with

breast cancer listed as the primary cause of death for 152 cases. Compared to

non-use, current metformin treatment was associated with a significant reduction

in overall mortality (adjusted HR 0.74, 95% CI, 0.58-0.96). For breast

cancer-specific mortality, a non-significant risk reduction (adjusted HR 0.88,

95% CI, 0.59-1.29) was observed, which became significant after stratification

according to cumulative number of prescriptions. An increased risk of both

overall and breast cancer-specific mortality was observed in the first 12 months

after discontinuation of metformin.

CONCLUSIONS: We observed a nonsignificant reduction in breast cancer-specific

mortality associated with metformin exposure among breast cancer patients treated

with antidiabetic drugs. However, our findings suggest that long-term metformin

use may have a beneficial effect on survival in patients with breast cancer.

Further confirmation of these findings is needed. PMID: 24215316

22. Ann Oncol. 2013 Oct;24(10):2506-14.

**Obesity, diabetes, and survival outcomes in a large cohort of early-stage breast cancer patients.**

Jiralerspong S Kim ES, Dong W, Feng L, Hortobagyi GN, Giordano SH.

Author information: Lester and Sue Smith Breast Center, Department of Medicine, Dan L. Duncan

Cancer Center, Baylor College of Medicine, Houston.

BACKGROUND: To determine the relationship between obesity, diabetes, and survival

in a large cohort of breast cancer patients receiving modern chemotherapy and

endocrine therapy.

PATIENTS AND METHODS: We identified 6342 patients with stage I-III breast cancer

treated between 1996 and 2005. Patients were evaluated according to body mass

index (BMI) category and diabetes status.

RESULTS: In a multivariate model adjusted for body mass index, diabetes, medical

comorbidities, patient- and tumor-related variables, and adjuvant therapies,

relative to the normal weight, hazard ratios (HRs) for recurrence-free survival

(RFS), overall survival (OS), and breast cancer-specific survival (BCSS) for the

overweight were 1.18 [95% confidence interval (CI) 1.02-1.36], 1.20 (95% CI

1.00-1.42), and 1.21 (95% CI 0.98-1.48), respectively. HRs for RFS, OS, and BCSS

for the obese were 1.13 (95% CI 0.98-1.31), 1.24 (95% CI 1.04-1.48), and 1.23

(95% CI 1.00-1.52), respectively. Subset analyses showed these differences were

significant for the ER-positive, but not ER-negative or HER2-positive, groups.

Relative to nondiabetics, HRs for diabetics for RFS, OS, and BCSS were 1.21 (95%

CI 0.98-1.49), 1.39 (95% CI 1.10-1.77), and 1.04 (95% CI 0.75-1.45), respectively.

CONCLUSIONS: In patients receiving modern adjuvant therapies, obesity has a

negative impact on RFS, OS, and BCSS; and diabetes has a negative impact on RFS

and OS. Control of both may be important to improving survival in obese and

diabetic breast cancer patients. PMID: 23793035

23. Br J Surg. 2013 Oct;100(11):1421-9.

**Systematic review and meta-analysis of the association between diabetes mellitus and incidence and mortality in breast and colorectal cancer.** De Bruijn K, Arends LR, Hansen BE, Leeflang S, Ruiter R, van Eijck CH.

Author information: Departments of Surgery, Erasmus MC University Medical Centre, The Netherlands.

BACKGROUND: Increasing evidence suggests that diabetes mellitus (DM) is

associated with increased cancer incidence and mortality. Several mechanisms

involved in diabetes, such as promotion of cell proliferation and decreased

apoptosis, may foster carcinogenesis. This study investigated the association

between DM and cancer incidence and cancer-specific mortality in patients with

breast and colorectal carcinoma.

METHODS: A meta-analysis of controlled trials, prospective cohort studies and

pooled cohort studies published after 2007 was conducted. Embase, PubMed and the

Cochrane Library were searched. Summary hazard ratios (HRs) were calculated using

a random-effects model. Sensitivity and subgroup analyses were performed to

adjust for confounders, mode of DM assessment and follow-up time.

RESULTS: Twenty studies were included to investigate the association between DM

and breast and colorectal cancer incidence and cancer-specific mortality. The

studies predominantly comprised patients with type II DM. The overall HR for

breast cancer incidence was 1·23 (95 per cent confidence interval 1·12 to 1·34)

and that for colorectal cancer was 1·26 (1·14 to 1·40) in patients with DM

compared with those without diabetes. The overall HR was 1·38 (1·20 to 1·58) for

breast cancer- and 1·30 (1·15 to 1·47) for colorectal cancer-specific mortality

in patients with DM compared with those without diabetes.

CONCLUSION: This meta-analysis indicated that DM is a risk factor for breast and

colorectal cancer, and for cancer-specific mortality. PMID: 24037561

24. Diabetes Care. 2013 Oct;36(10):3018-26.

**Association between metformin therapy and mortality after breast cancer: a population-based study.**

Lega IC, Austin PC, Gruneir A, Goodwin PJ, Rochon PA, Lipscombe LL.

OBJECTIVE: Metformin has been associated with a reduction in breast cancer risk

and may improve survival after cancer through direct and indirect

tumor-suppressing mechanisms. The purpose of this study was to evaluate the

effect of metformin therapy on survival in women with breast cancer using methods

that accounted for the duration of treatment with glucose-lowering therapies.

RESEARCH DESIGN AND METHODS: This population-based study, using Ontario health

care databases, recruited women aged 66 years or older diagnosed with diabetes

and breast cancer between 1 April 1997 and 31 March 2008. Using Cox regression

analyses, we explored the association between cumulative duration of past

metformin use and all-cause and breast cancer-specific mortality. We modeled

cumulative duration of past metformin use as a time-varying exposure.

RESULTS: Of 2,361 breast cancer patients identified, mean (±SD) age at cancer

diagnosis was 77.4±6.3 years, and mean follow-up was 4.5±3.0 years. There were

1,101 deaths (46.6%), among which 386 (16.3%) were breast cancer-specific deaths.

No significant association was found between cumulative duration of past

metformin use and all-cause mortality (adjusted hazard ratio 0.97 [95% CI

0.92-1.02]) or breast cancer-specific mortality (0.91 [0.81-1.03]) per additional

year of cumulative use.

CONCLUSIONS: Our findings failed to show an association between improved survival

and increased cumulative metformin duration in older breast cancer patients who

had recent-onset diabetes. Further research is needed to clarify this

association, accounting for effects of cancer stage and BMI in younger

populations or those with differing stages of diabetes as well as in nondiabetic

populations. PMID: 23633525

25. Am Soc Clin Oncol Educ Book. 2013:52-9.

**Obesity and its impact on breast cancer: tumor incidence, recurrence, survival, and possible interventions.**

Ligibel JA, Strickler HD.

Author information: Department of Adult Oncology, Dana-Farber Cancer Institute, Boston, MA

A positive association between obesity and the risk of incident postmenopausal

breast cancer has been consistently observed in epidemiologic studies. Although

most studies of premenopausal women have not found a similar relationship between

breast cancer and obesity, the prognosis for both pre- and postmenopausal breast

cancer is substantially worse among obese than normal-weight individuals.

Increasing evidence suggests that these associations may be mechanistically

related to sex hormones, insulin, and certain adipokines. Insulin, for example,

has important mitogenic/antiapoptotic activity in addition to its metabolic

effects, and many breast tumors express high levels of the insulin receptor

(IR)-A isoform. Further, the use of metformin, a diabetes medication that reduces

insulin levels, has been epidemiologically associated with reduced breast cancer

risk among patients with diabetes, and a recent observational study found a

higher rate of pathologic complete responses among patients with diabetes and

breast cancer who were using metformin. Formal clinical trials of metformin as

adjuvant breast cancer therapy have been initiated and are ongoing. Similarly,

the effect of lifestyle changes on breast cancer outcomes is actively being

investigated. Several lifestyle intervention studies have demonstrated that

weight loss, increased physical activity, and dietary changes are feasible in

breast cancer populations, and that individuals who make lifestyle changes after

breast cancer diagnosis experience several physical and psychologic benefits. In

this article, the authors review the evidence linking obesity with breast cancer

risk and outcomes and provide an overview of lifestyle intervention studies in

patients with breast cancer. PMID: 23714455

26. Cancer Causes Control. 2012 Nov;23(11):1785-95.

**Associations of type 2 diabetes and diabetes treatment with breast cancer risk and mortality: a population-based cohort study among British women.** Redaniel MT, Jeffreys M, May MT, Ben-Shlomo Y, Martin RM.

Author information: School of Social and Community Medicine, University of Bristol, UK.

PURPOSE: There is great interest in whether type 2 diabetes and its treatments

alter breast cancer risk and prognosis, but previous studies are inconclusive. We

conducted a cohort study within the UK General Practice Research Database to

investigate associations of type 2 diabetes and patterns of diabetes treatment

with breast cancer risk and all-cause mortality.

METHODS: We identified 52,657 women with type 2 diabetes, diagnosed between 1987

and 2007, and 30,210 randomly selected women without diabetes. We performed a

time-dependent analysis using Cox proportional hazards models.

RESULTS: Diabetes was associated with a 29 % increased overall breast cancer risk

(95 % CI: 1.16-1.44), but the association markedly attenuated when adjusted for

age, period of cohort entry, region, and body mass index (BMI) (HR: 1.12; 95 %

CI: 0.98-1.29). Women with breast cancer and pre-existing diabetes had a 49 % (95

% CI: 1.17-1.88) increased all-cause mortality risk compared with women with

breast cancer but without diabetes, after controlling for age, period, region,

BMI, smoking, alcohol, and deprivation. Compared with sulfonylurea, we found weak

evidence that metformin monotherapy (HR: 1.04; 95 % CI: 0.79-1.37) and insulin

(HR: 1.33; 95 % CI: 0.63-2.83) modified breast cancer risk among women with diabetes.

CONCLUSIONS: We found weak evidence that diabetes is associated with a small

increased risk of breast cancer. Among treated women, there is no evidence that

anti-diabetes treatments modify the risk of developing breast cancer, with wide

confidence intervals indicating imprecise effect estimates. Women with breast

cancer and diabetes, however, had an increased all-cause mortality risk

highlighting the potential importance of maintaining adequate glycemic control

alongside anti-cancer treatments and subsequent follow-up. PMID: 22971998

27. Endocr Pract. 2012 Nov-Dec;18(6):898-905.

**Cancer with diabetes: prevalence, metabolic control, and survival in an academic oncology practice.**

Karlin NJ, Dueck AC, Cook CB.

Author information: Division of Hematology Oncology, Mayo Clinic Scottsdale, Scottsdale, Arizona

OBJECTIVE: To determine the prevalence of diabetes mellitus, glycemic control,

and impact of diabetes on overall survival in an academic oncology practice.

METHODS: Data on cancer patients (1999 to 2008) were retrieved from the

institutional cancer registry and linked to electronic files to obtain diabetes

status and hemoglobin A1c (A1C) values within the first 6 months of cancer

diagnosis. Overall survival by cancer type with and without diabetes was compared

using Cox regression.

RESULTS: Excluding skin and hematologic malignancies, 15,951 cancer cases were

identified. Overall diabetes prevalence was 6.8% (n = 1,090), declining over time

(P<0.001). Diabetes was common among patients with pancreatic (9.8% [61 of 624]),

colorectal (7.7% [89 of 1,151]), or bladder cancers (7.6% [68 of 899]). Patients

with diabetes were older (mean age, 70 versus 66 years; P<0.001) and more likely

to be male (66.3% [723 of 1,090] versus 60.2% [8,949 of 14,858]; P<0.001). The

mean A1C among diabetic cancer patients was 6.8% and did not differ across cancer

types (P = 0.80). Only 58.6% (331 of 565) of diabetic cancer patients had all A1C

<7.0% during the first 6 months following cancer diagnosis. Pancreatic cancer

patients with coexisting diabetes had better overall survival than pancreatic

cancer patients without diabetes (hazard ratio, 0.60; 95% confidence interval

0.44 to 0.80; P<0.001). Conversely, diabetic prostate cancer patients had worse

overall survival than prostate cancer patients without diabetes (hazard ratio,

1.36; 95% confidence interval 1.05 to 1.76; P = 0.02).

CONCLUSION: In this academic oncology practice, diabetes was common, glycemic

control often was suboptimal, and survival varied by cancer type. Additional

study is needed to optimize glucose management and investigate mechanisms

underlying age, sex, and survival differences. PMID: 22982797

28. BMC Cancer. 2012 Oct 15;12:472.

**Population-based study of breast cancer in older women: prognostic factors of relative survival and predictors of treatment.** Dialla PO, Dabakuyo TS, Marilier S, Gentil J, Roignot P, Darut-Jouve A,

Author information: Breast and Gynaecologic Cancer Registry of Cote d'Or, Centre Georges François Leclerc, France.

BACKGROUND: A large proportion of women with breast cancer (BC) are elderly.

However, there is a lack of information regarding BC prognostic factors and care

in this population. The aims of this study were to assess the prognostic factors

of relative survival (RS) among women with BC aged ≥ 75 years old and to identify

the predictive factors of treatments administered to this population.

METHODS: A population-based study was performed using data from the Cote d'Or

breast and gynaecological cancer registry. Women aged 75 years and older with

primary invasive BC and resident in Cote d'Or at the time of diagnosis made

between January 1998 and December 2008 were retrospectively selected. Prognostic

factors of RS were estimated in a generalized linear model with a Poisson error

structure. RS rate for the whole population was given at 5 years. Logistic

regression models were used to identify the predictors of the treatments administered.

RESULTS: Six hundred and eighty-one women were included. Median age at diagnosis

was 80. Comorbidities (p = 0.02), pT stage (p = 0.04), metastases (p =< 0.001),

having a family doctor (p = 0.03) and hormone-receptor status (p = 0.006) were

independent prognostic factors of RS. The RS rate at 5 years for the whole

population was 78.2%, 95%CI = [72.2-83.0]. Age, pT stage, metastases,

histoprognostic SBR grade, hormone receptor status and comorbidities were

frequently found to be predictors of treatment with surgery alone, hormone

therapy alone, breast conserving surgery plus adjuvant therapy and mastectomy

plus adjuvant therapy.

CONCLUSIONS: Comorbid conditions adversely affect survival in older women with

breast cancer. Moreover the results of this study showed that there are numerous

predictors of the type of treatment administered, and that the most important

were age and comorbidities. PMID: 23066863