Landmark analysis of ipsilateral invasive breast cancer after ductal carcinoma in situ: a population-based cohort study

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INTRODUCTION

- The incidence of ductal carcinoma in situ (DCIS) has risen with population-based mammographic screening and now represents about a quarter of screen-detected breast cancers.
- Despite favourable survival prognosis, the main concern for DCIS is progression to ipsilateral invasive breast cancer (iIBC).
- Landmark analysis provides relevant prognostic information for patients who remain event free for some time.
- Whether prognostic factors associated with the subsequent iIBC persist at 5-year landmark remained unknown.

METHODS

- We conducted a retrospective cohort study to characterise the risks of iIBC among women diagnosed with DCIS in New Zealand.
- Women with unilateral DCIS diagnosed between 2000 and 2022, who received locoregional treatment were identified from breast cancer national register.

Statistical analysis

- Cumulative incidence of iIBC was calculated with death as a competing risk.
- Multivariable Fine-Gray subdistribution hazard models were used to estimate hazard ratios (sHRs).
- Landmark analyses were performed for patients who remained event-free at 1-, 3-, and 5-years post-diagnosis.

PATIENT CHARACTERISTICS

A total of 5740 women diagnosed with unilateral DCIS as their first breast cancer were included.

81.2% of patients were in the screening age (45-69 years) at diagnosis.

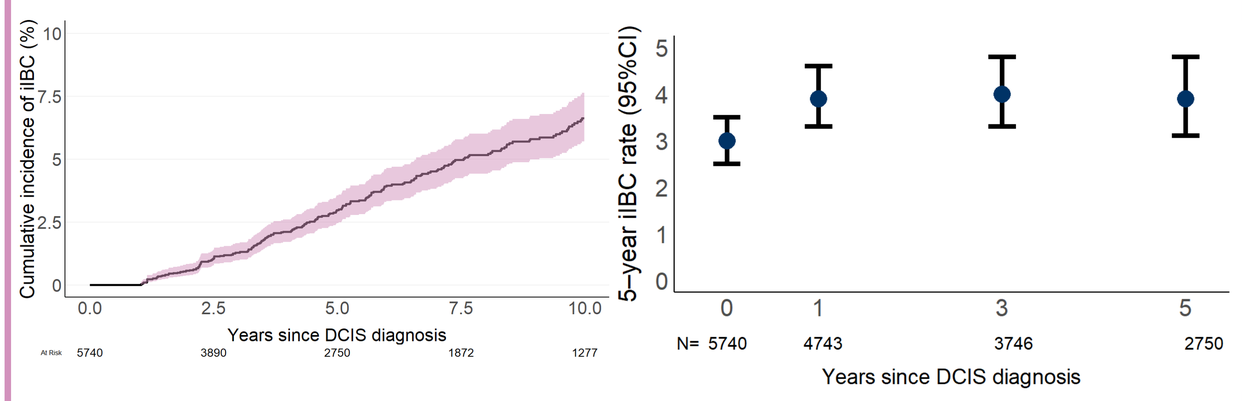
65% had breast conserving surgery (BCS), with or without radiotherapy (RT).

Table 1. Patient characteristics by types of locoregional treatment.

	BCS alone N = 1,543	BCS with RT N = 2,197	Mastectomy N = 2,000
Age at diagnosis			
<45	98 (6.4%)	104 (4.7%)	259 (13.0%)
45-69	1,254 (81.2%)	1,960 (89.2%)	1,552 (77.5%)
>69	191 (12.4%)	133 (6.1%)	189 (9.5%)
DCIS size			
≤20mm	1,372 (88.9%)	1,452 (66.1%)	482 (24.1%)
>20mm	171 (11.1%)	745 (33.9%)	1,518 (75.9%)
DCIS grade			
Low	543 (35.2%)	169 (7.7%)	173 (8.7%)
Intermediate	672 (43.6%)	830 (37.8%)	579 (29.0%)
High	297 (19.2%)	1,190 (54.1%)	1,234 (61.6%)
Unknown	31 (2.0%)	8 (0.4%)	14 (0.7%)

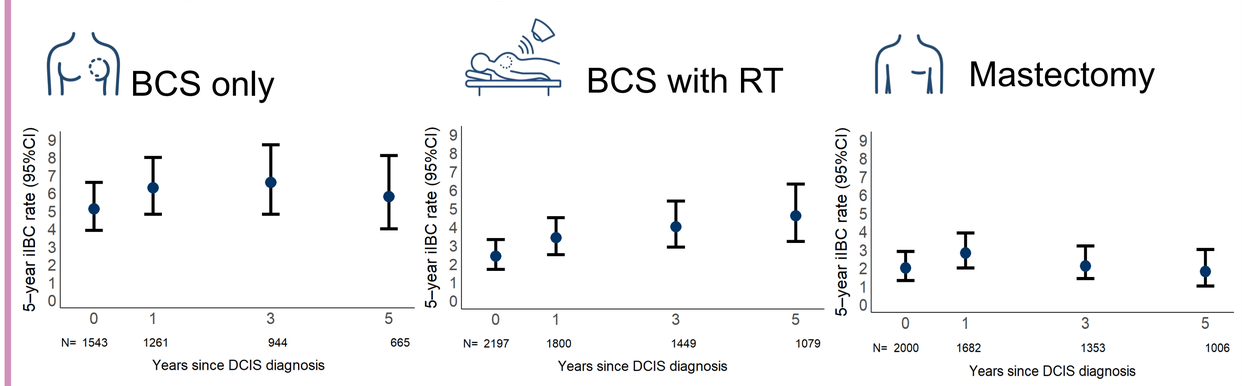
CUMULATIVE RISKS

Overall cohort



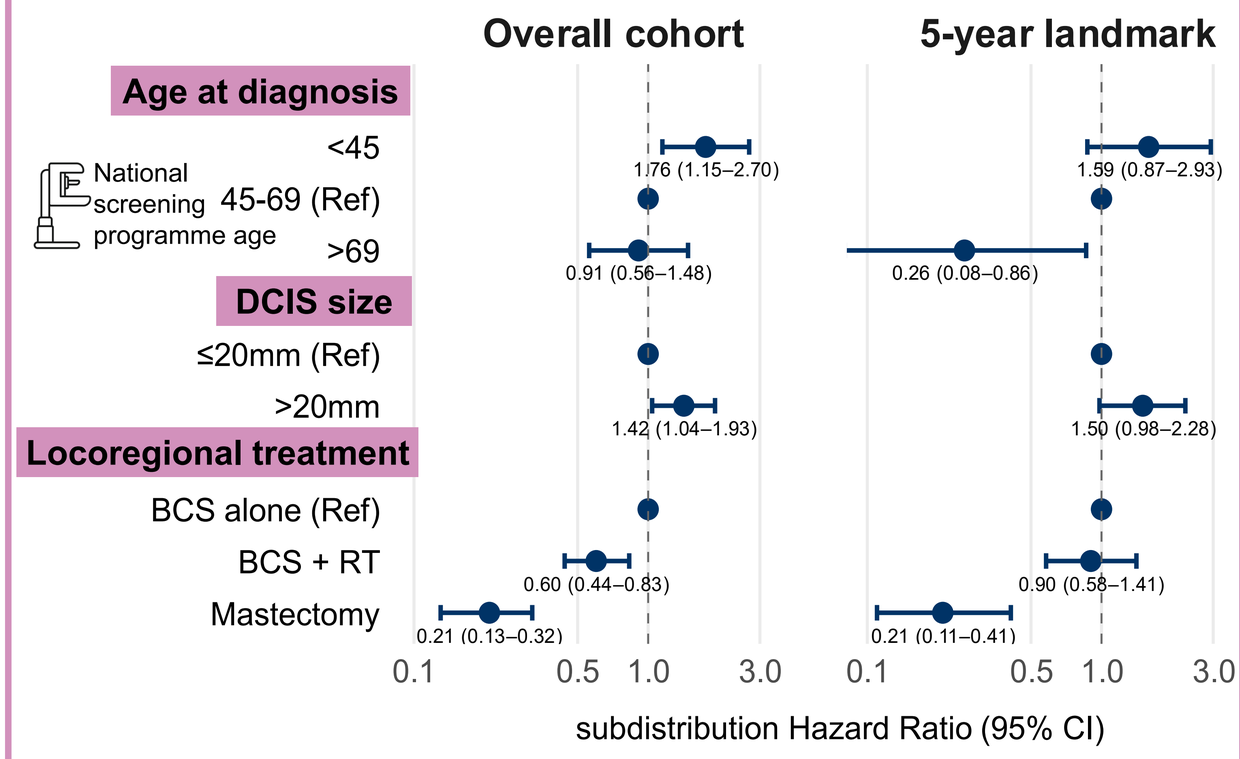
- The 5-year cumulative incidence of iIBC was 3.2% in the overall cohort.
- In landmark analyses at 1, 3, and 5 year, the subsequent 5-year risks were stable at approximately 4.0%.

Locoregional treatment groups



- The 5-year cumulative incidence of iIBC was the highest in patients who received BCS only.
- In landmark analyses at 1, 3, and 5 year, the subsequent 5-year risks were slightly increased among BCS, with or without RT.

PROGNOSTIC FACTORS



Note: Model adjusted for age group, ethnicity, deprivation index, rurality, detection method, DCIS size, DCIS grade, necrosis status, facility of surgery, surgical margin, axillary, oestrogen status.

- In the overall cohort, age <45 years or DCIS >20mm were associated with higher risk of iIBC, while RT after BCS was associated with lower risk.
- At 5-year landmark, the higher iIBC risk associated with age <45 years slightly attenuated, while the risk associated with DCIS size persisted.
- The lower iIBC risk associated with RT after BCS was less pronounced.

CONCLUSIONS

- The subsequent 5-year risk of iIBC appeared stable at each landmark.
- Continued long-term mammographic surveillance is important for women with larger DCIS, those treated with BCS, and possibly in younger women aged under 45.

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