Pathological response as prognostic indicator for recurrence and survival in early triple negative breast cancer (eTNBC) - use case for multi-centre RWD to support patient access

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Objective

Describe the survival outcomes for patients who achieved and did not achieve pCR, as well as the clinical characteristics and treatments received.

Background

New medicines added to neoadjuvant chemotherapy (NACT) may lead to higher pathological complete response (pCR) rates and improved survival in eTNBC. This study comes from 2 UK Cancer Centres, Leeds Teaching Hospitals NHS Trust (DATA-CAN) and the Edinburgh Cancer Centre (NHS Lothian). DATA-CAN is the UK's Health Data Research Hub for Cancer, a UK wide partnership of six founding organisations including hospitals, and universities. The Cancer Research UK Edinburgh Centre is a partnership between Cancer Research UK (CRUK), NHS Lothian and the University of Edinburgh.

Methods

A retrospective, longitudinal cohort study was conducted using data from routine care records of patients with eTNBC from the two UK Cancer Centres. The final Leeds-Edinburgh pooled cohort comprised 228 women. After data extraction and linkage, manual curation and quality control were undertaken. Descriptive statistics on demographics, clinical characteristics, and treatment patterns were drawn; survival outcomes were obtained through Kaplan-Meier analysis of overall survival (OS) and event-free survival (EFS) data. The limitation of missing data was mitigated by manual curation by trained clinical staff.

Cohort description

The median follow-up was of four and half years. 50% of patients were less than 50 years old at the time of diagnosis. Clinical trial involvement was limited to 8 patients in the neo-adjuvant setting and was absent in the adjuvant setting

Table 1:

Patient characteristics n = 228		
Age Group	**No.**	**%**
< 40 (years)	41	18
40-44	37	16.2
45-49	36	15.8
50-54	31	13.6
55-59	29	12.7
60-64	23	10.1
65-69	12	5.3
70-74	12	5.3
>75	7	3.1

Table 2:

Tumour Characteristics n = 228		
Tumour size	**No.**	**%**
< 2cm	22	9.7
≥ 2cm	198	86.8
missing	8	3.5
Stage (AJCC)	**No.**	**%**
I	13	5.7
II	147	64.5
III	59	25.9
missing	9	3.9
Clinical Stage T	**No.**	**%**
T1	22	9.6
T2	132	57.9
T3	29	12.7
T4	37	16.2
missing	8	3.5
Clinical Stage N	**No.**	**%**
N0	94	41.2
N1+	117	51.3
missing	17	7.5
Grade	**No.**	**%**
1	≤ 5	≤ 2.2
2	34	15.7
3	190	83.3
missing	≤ 5	≤ 2.2
Other primary, No. , %	13	6
pCR	**No.**	**%**
1 (Yes)	74	32.5
0 (No)	154	67.5

Chemotherapy regimens

The proportion of different chemotherapy regimens changed over time (Table 3) and key pathway metrics are presented with regards to timing of diagnosis, diagnosis and chemotherapy.

Table 3: absolute numbers and percentages of the SACT class use by year of diagnosis.

Chemotherapy, count (%)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Platinum	0 (0)	≤ 5 (22)	0 (0)	≤ 5 (19)	≤ 5 (13)	0 (0)	≤ 5 (14)
Anthracycline and Taxane	14 (58)	18 (78)	20 (80)	21 (72)	26 (63)	41 (85)	34 (89)
Anthracycline, no Taxane	9 (38)	≤ 5 (22)	≤ 5 (25)	7 (24)	11 (27)	≤ 5 (10)	≤ 5 (14)
Taxane, no Anthracycline	≤ 5 (22)	0 (0)	≤ 5 (25)	0 (0)	≤ 5 (13)	≤ 5 (10)	≤ 5 (14)
Other	11 (46)	12 (52)	9 (36)	8 (28)	11 (27)	22 (46)	13 (34)
Number of Diagnoses, count	**24**	**23**	**25**	**29**	**41**	**48**	**38**

Table 4:Key pathway metrics.

All Patients	Median	Mean (SD)	Range
Time from diagnosis to surgery (days)	174	180 (30.3)	91 - 291
Time from diagnosis to first chemo (days)	30	33 (13.7)	0 – 139
Time from first chemo to surgery (days)	142	147 (29.9)	42 - 270

OS/IDFS and pCR status outcomes

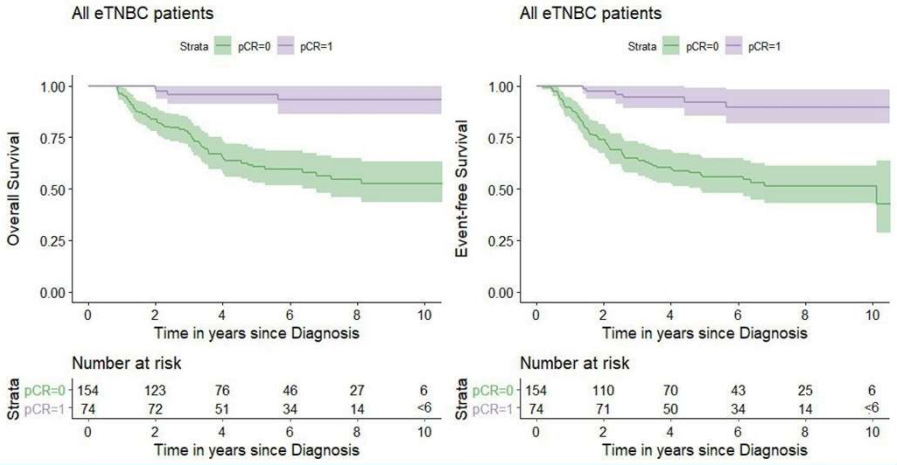
Table 5:

All eTNBC Patients

OS	Year	Survival	95% CI	EFS	Year	Survival	95% CI
non-pCR	5	0.61	0.53 – 0.69	*non-pCR*	5	0.56	0.48 – 0.65
	10	0.52	0.43 – 0.63		10	0.51	0.43 – 0.61
pCR	5	0.96	0.91 – 1	*pCR*	5	0.85	0.86 – 0.99
	10	0.93	0.86 – 1		10	0.82	0.81 – 0.98

The analysis performed on the full cohort suggests that pCR is a strong predictor of overall and event-free survivals with approximately 30% more patients alive at 5 years if they had achieved pCR following NACT, compared to patients who did not achieve pCR.

Figure 1:



Conclusion

The findings from this real-world retrospective study demonstrate the differences in survival outcomes between patients achieving pCR and those who do not. Patients who received NACT and had a documented pCR status had improved survival outcomes compared to non-pCR patients. The poor survival outcomes in patients not achieving pCR after NACT demonstrates a significant unmet need in this population. The findings of this study show the differences in survival outcomes between patients achieving pCR and non-pCR patients.

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