Healthcare resource utilisation and survival of patients with HR+/HER2- metastatic breast cancer after treatment with CDK4/6-inhibitors in Finland

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BACKGROUND

- CDK4/6-inhibitors (CDK4/6i) have had a great impact on the treatment landscape for hormone receptor positive/human epidermal growth factor receptor 2-negative (HR+/HER2-) metastatic breast cancer (mBC) patients (**1**).
- CDK4/6i have been available as first line (1L) treatment for patients with HR+/HER2- mBC in Finland since 2017. However, data on outcomes and healthcare resource (HCRU) utilisation in second line (2L) setting of mBC patients previously treated with 1L CDK4/6i are sparse.

AIM

The overarching aim of the study was to describe HR+/HER2- mBC patients treated with 1L CDK4/6-inhibitors and assess their outcomes and healthcare resource utilisation both in 1L and 2L.

RESULTS

- Alltogether 356 patients with HR+/HER2- mBC, treated in 1L with CDK4/6i were identified. Median follow-up was 27 months, **Table 1**.
- Distant recurrence after early BC was observed in 60% of patients, **Table 1.** The median time from early BC to mBC was 4.1 years (25th and 75th percentile: 1.9 to 7.4 years).
- Age at diagnosis of mBC was 66 years and median age at 2L treatment initiation was 67 years [66 years at chemotherapy (CT) onset and 75 years at endocrine therapy (ET) onset], **Table 1 and 2**.
- 104 patients initiated 2L treatments with CT and 45 patients with ET, **Table 2**.
- The median time from 1L CDK4/6i treatment to next treatment (TTNT) was 25.2 months, **Figure 1.** At median TTNT 2L initiation probability was 40.7% (35.6-46.5%), and death 9.1% (6.5-12.8%).
- Median overall survival of 1L CDK4/6i treated patients was 54.2 months, whereas it was 19.5 and 19.6 months for 2L CT and ET treated patients following 1L CDK4/6i respectively, **Figure 2**.
- In the 1L CDK4/6i treated patients first-year any health-related specialised care costs were €18,273 (95%CI: 17,077 - 19,470) and BC related costs 59% of these, €10 754 (10,076-11,432) per patient, **Figure 3A**.
- Any health-related first year costs in 2L CT treated patients were €19,799 (16,922 - 22,675) and in 2L ET €9,517 (6,216-12,818) per patient-year, **Figure 3A**.
- Especially inpatient days of any cause was higher in patients treated with 2L CT compared to 2L ET or 1L CDK4/6i [5.2 days (95%CI: 3.2-7.2) vs. 1.9 (0.5-3.3) vs. 3.5 (2.7-4.3) per patient-year, **Figure 3B**.
- Most contacts were specialised care outpatient visits, with the higest rate in 2L CT treated patients (29.1 outpatient visits in the first year) followed by those on 1L CDK4/6i (21.3) and 2L ET (14.8), **Figure 3B**.

METHODS

- Electronic health record (EHR) data from the Helsinki and Uusimaa Hospital district, Finland, with a population base of 1.6 million inhabitants (30% of population) were extracted and analysed for patients with a breast cancer diagnosis. Data included pathology, diagnoses, in- and outpatient treatments, procedures, radiology, contacts, deaths and demographics, **Figure 4**.
- Patients with HR+/HER2- mBC that received 1L CDK4/6-inhibitors between 01 January 2017 and 30 June 2023 were identified. Data on primary eBC diagnosis were available from January 2013 onwards.
- Patients were characterised at the detection of metastasis. A patient was considered *de novo* mBC if the metastasis was detected within 3 months from diagnosis or during adjuvant chemo- or radiotherapy.
- In the TTNT analyses, patients were followed from diagnosis to next treatment line onset (event), death (event), or end of follow-up (censoring event). Aalen-Johanson estimates were used to account for the competing risk setting between treatment switch and death.
- Overall survival was analysed with Kaplan-Meier fits as the time from beginning of the respective treatment line until death (all-cause; event) or end of follow-up (censoring event).
- Specialised care contact types and durations were considered for HCRU during the first year after mBC, reported as per patient-year estimates. Costs for contacts were derived from the Finnish national unit costs listing (**2**). Events with a main diagnosis of C50 were classified as breast cancer related. Comorbidity index was analysed according to (**3**).

Figure 4. Study data included EHRs from Helsinki and Uusimaa region in Finland.

References

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3. *Quan et al. 2010 American Journal of Epidemiology 173; 6; 676-682*
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Abbreviations BC - breast cancer; CDK4/6i - cyclin dependent kinase 4/6 inhibitors; CT - chemotherapy; EHR - electronic health records; ET - endocrine therapy; HCRU; - healthcare resource utlisation; HR+ - hormone receptor positive; HER2- human epidermal growth factor receptor 2-negative; mBC - metastatic breast cancer; TTNT - time to next treatment; 1L - first line treatment; 2L - second line treatment

Figure 1. Time to next treatment in first line (1L) CDK4/6 inhibitor treated HR+/HER2- mBC patients, with competing risk of the composite outcome of next line of treatment onset (LOT) and all-cause death.

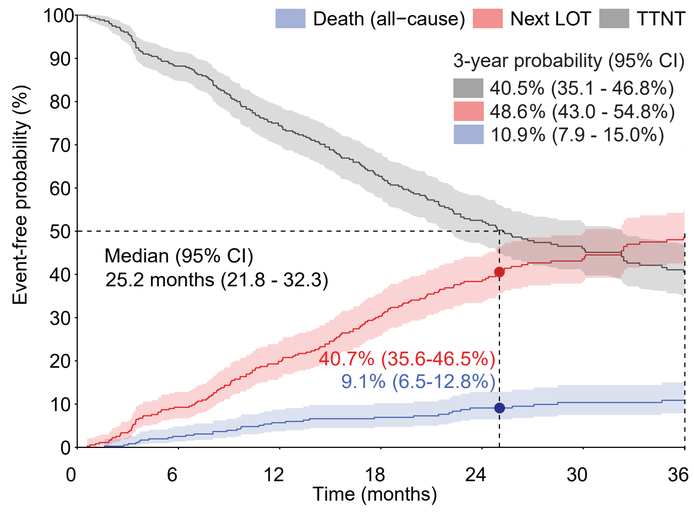


Figure 2. Overall survival of HR+/HER2- mBC patients treated with a CDK4/6 inhibitor in 1L (A), and after 2L onset by treatment type ET or CT (B).

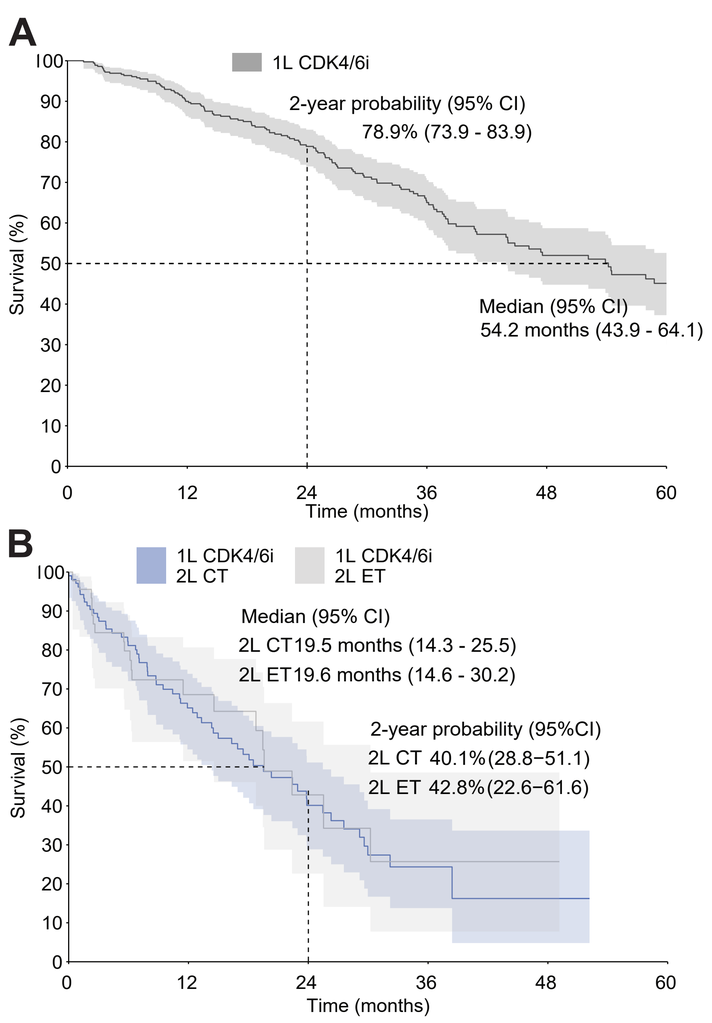
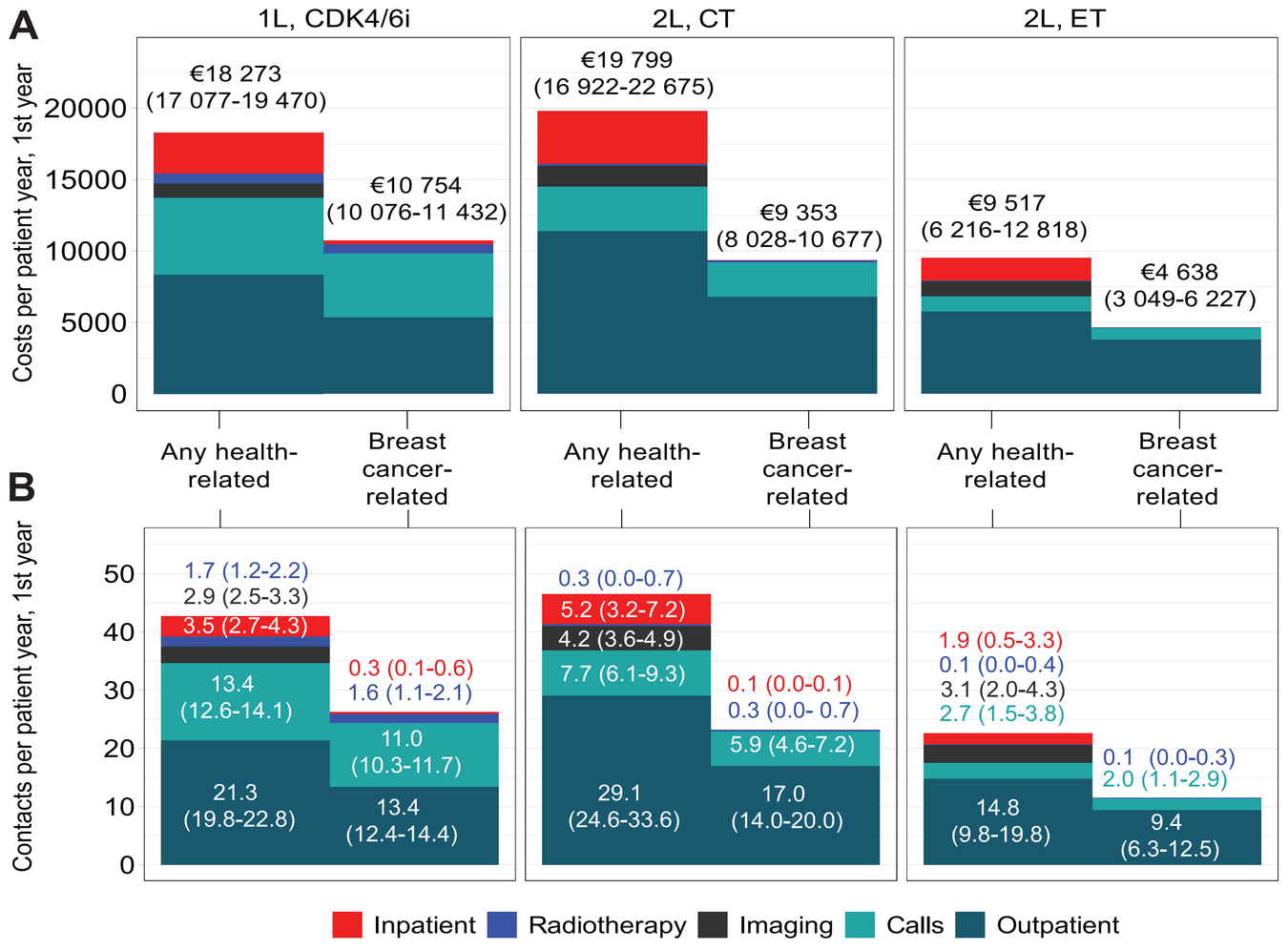


Figure 3. Specialised care first year HCRU costs (A) and contacts per patient-year (B) of HR+/HER2- mBC during first line (1L) and second line (2L) treatments in patients. Average (95% CI).



CONCLUSIONS

- Median 1L CDK4/6i treatment duration was similar in this RW population compared to those reported in clinical trials (**4-6**).
- The limited follow-up time may lead to overrepresentation of rapid progressors from 1L to 2L mBC, in both 2L cohorts. This could potentially drive the finding that 2L CT use was more common than ET within the follow-up period.
- Patients starting 2L CT were younger, while ET use was associated with older age.
- 2L CT was associated with significantly higher healthcare resource utilization compared to ET, particularly in outpatient contacts (2-fold) and inpatient days (2.7-fold). In contrast, 2L ET had the lowest first-year specialty care costs. This could suggest that 2L CT was used for more aggressive disease and required additional side effect management.
- Real-world OS was comparable for 2L CT and ET post-1L CDK4/6i, consistent with recent literature (**7**).

Table 1. Clinical characteristics of first line (1L) CDK4/6 inhibitor treated HR+/HER2-mBC patients.

Characteristics	N = 356
Length of follow-up, months	27 (17, 41)
Age at diagnosis of mBC, years	66 (57, 74)
Age at diagnosis of mBC, categorial	
Less than 50	42 (12%)
50 - 59	71 (20%)
60 - 69	97 (27%)
70 - 79	117 (33%)
over 80	29 (8.1%)
Age at beginning of 1L, years	66 (56, 74)
Distant recurrence after early BC	215 (60%)
De novo metastatic at diagnosis	141 (40%)
Year of mBC	
2017-2018	64 (18%)
2019-2020	104 (29%)
2021-2022	147 (41%)
Jan - June 2023	41 (12%)
Charlson Comorbidity index (Quan et al)	
0	294 (83%)
≥1	62 (17%)
Age at beginning of 2L, years	67 (57, 76)

Data presented as number and proportion (%) or, median (25th, 75th percentile)

Table 2. Number and age of patients initiating 2L treatment with CT or ET, after 1L CDK4/6i treatment.

Characteristics	2L CT	2L ET
Number of patients with 2L treatment	104	45
Age at beginning of 1L, years	65 (55, 73)	73 (67, 80)
Age at beginning of 2L, years	66 (57, 74)	75 (67, 81)

Data presented as number or, median (25th, 75th percentile)

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