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Stage, duration and cost of Breast Cancer treatment in India

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Key points

- Of the 500 breast cancer patients registered for treatment, 86% completed treatment and only 41% had follow-up visits after six months of completion of treatment.
- Median age at diagnosis of breast cancer was 47 years and over two-third of breast cancer cases were diagnosed at the advanced stage.
- The mean cost and OOP payment shows an increasing pattern with duration of treatment.
- With a significant risk of financial catastrophe, the out-of-pocket (OOP) payment for breast cancer treatment was \$270 compared to \$205 in USA and \$202 (at 2020 prices) in high-income countries.
- Earlier studies estimated the OOP payment for any cancer treatment at ₹100,813 at 2020 prices (based on data from National Sample Survey, 2018) while our study estimated the OOP for Breast cancer treatment at ₹186,461.
- OOP payment accounts for 70% of the breast cancer treatment cost.
- About 38% breast cancer patients availed of a loan for cancer treatment at the time of registration, which increased to 65% at the time of completion of treatment.

Introduction

Of two million cancer cases in India, 14% were diagnosed with breast cancer and the mortality of breast cancer patients was higher than the global average (Bray et al., 2018). Breast cancer treatment exerts high economic, social and health burden on patients and households during and after treatment. Among others, late diagnosis, poor access to cancer treatment, familial negligence, social stigma, high cost of treatment, low standard of living, and lack of social safety nets are some of the probable causes of high cancer mortality in the country (Ginsberg et al., 2017).

Cancer statistics from the cancer registry in India provide regular estimates of size, deaths and new cases by type of cancer. The population-based surveys such as the National Family Health Survey (NFHS) provide information on cancer-screening and the National Sample Survey (NSS) provides expenditure on cancer treatment. The NSS surveys are cross-sectional, do not provide data on types of cancer and is subject to recall bias. Studies that estimated the overall cost of cancer treatment based on these cross-sectional household data (Goyanka, 2021) are likely to be under-estimated especially for cancers whose treatment continues over a long period.

This research brief describes socio-demographic profile, disease related characteristics, cost of cancer treatment, reimbursement and OOP payment from a prospective cohort of 500 breast cancer patients registered for treatment at Tata Memorial Cancer Hospital (TMC), Mumbai. The unique feature of this study is the collection of data on expenditure on each visit and during the entire course of treatment at TMC.

Data & Methods

Data used from a study entitled “Health Expenditure on Breast Cancer Treatment in Women: A Study from Public Sector Tertiary Cancer Centre” (EXPERT), conducted jointly by the Tata Memorial Centre (TMC), Mumbai, and the International Institute for Population Sciences (IIPS), Mumbai, Maharashtra, India. Prior approval from the institutional ethics committee was taken and the study was registered on the Clinical Trial Registry of India (CTRI/2019/07/020142). Data on cost of treatment was collected during each visit of the patient to TMC. A baseline survey at the time of registration, an end line survey on completion of treatment and a follow-up survey after six months of treatment completion was conducted from June 2019 to March 2022. A total of 500 breast cancer patients were interviewed at baseline, out of which 71 patients discontinued and 429 were interviewed at the end line. A total of 206 patients were interviewed in follow-up visits, six months after the completion of treatment.

Results

The median age for breast cancer diagnosis was 47 years while only 6% were diagnosed below the age of 30 years (Fig 1).

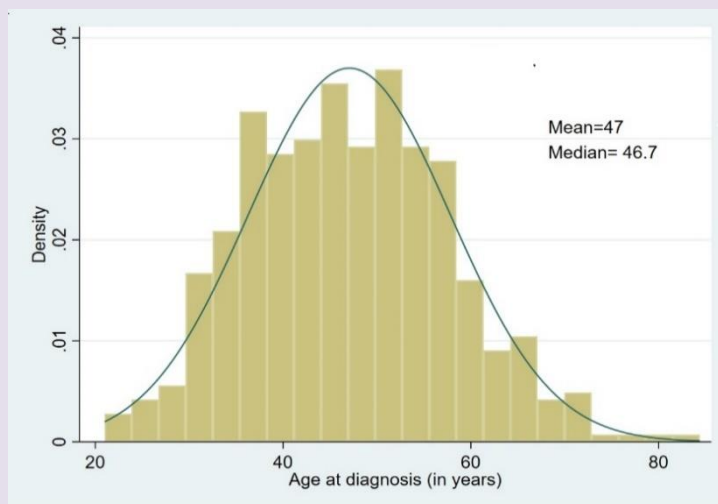


Figure 1: Distribution of age at diagnosis of breast cancer patients

About one-third of the breast cancer patients were diagnosed at an early stage while two-third were diagnosed at an advanced stage of cancer. Even among those who had completed higher secondary education and above, three-fifths were diagnosed at the advanced stage (Fig 2). On an average, a patient visited the hospital 47 times and the average duration of treatment was 276 days.

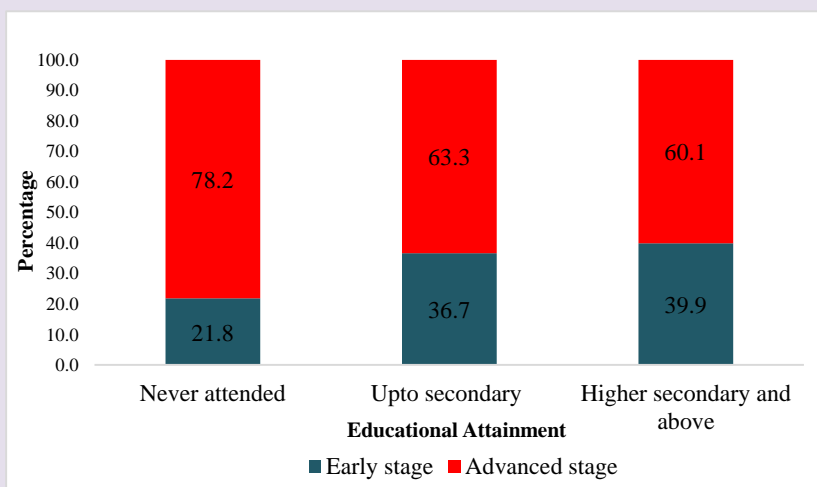


Figure 2: Percent distribution of stage at diagnosis of breast cancer by level of education

Table 1 shows the average medical, non-medical and total cost of treatment, reimbursement and OOP payment of breast cancer patients by stage of cancer at diagnosis. The mean total cost of cancer treatment was ₹231,335 for early stage patients and ₹273,233 for those at advanced stage. The mean medical cost of treatment was ₹136,661 in early stage and ₹150,325 in advanced stage of cancer. For each of the components, the average cost of treatment was higher at the advanced stage compared to that in the early stages of cancer. The mean reimbursement received for treatment was ₹78,016; ₹72,461 for early stage patients and ₹81,158 for advanced stage patients. On an average the mean OOP payment of breast cancer was ₹186,461 and only about 30% of the total expenditure was reimbursed.

Table 1: Total cost, reimbursement and out-of-pocket (OOP) payment (in ₹) of breast cancer treatment by stage at diagnosis.

Stage of Cancer	Early stage (I/II)			Advanced stage (III/IV)			Overall		
Type of Costs	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD
Total Medical Cost	91027	136661	127766	110192	150325	125447	112929	145388	126312
Registration Cost	100	208	355	100	269	840	100	247	705
Consultation Cost	0	1302	3516	0	1900	4851	900	1684	4421
Admission Cost	2450	4699	7091	2762	4909	7819	2580	4833	7556
Investigation Cost	11083	17214	15883	18174	23517	19461	23295	21239	18481
Medicine Cost	4274	7497	11712	4413	7894	10374	4770	7751	10864
Surgery Cost	9613	26331	41276	9954	24366	37526	9879	25075	38886
Chemotherapy Cost	16366	45620	64262	23012	53838	70357	20376	50869	68256
Radiotherapy Cost	13885	33608	51618	15000	33411	46865	14000	33483	48576
Total Non-Medical Cost	58560	94674	113434	91887	122908	134394	75667	112707	127808
Food Cost	30267	38925	41696	44646	50236	45582	38333	46149	44502
Travel Cost	10200	17496	24942	10185	19006	23227	10780	18460	23843
Accommodation Cost	0	38253	70721	17338	53666	96954	7159	48097	88603
Total Cost	166697	231335	196810	218236	273233	214562	212289	258095	209064
Total reimbursement	31547	72461	140015	40592	81158	113345	34611	78016	123555
Total OOP payment	106154	164721	175238	137437	198759	209189	126988	186461	198065
Share of reimbursement to total cost (in %)	18.9	31.3	NA	18.6	29.7	NA	16.3	30.2	NA

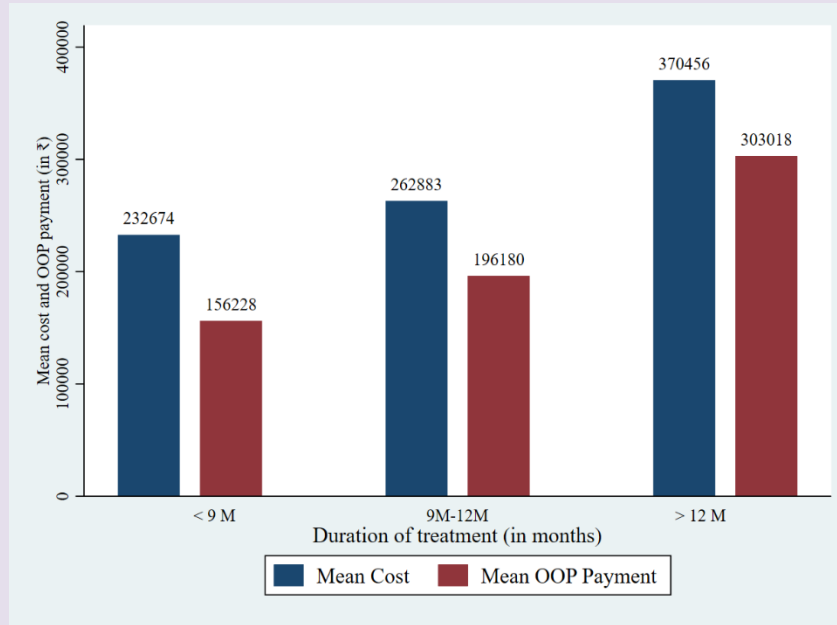


Figure 3: Mean total cost (in ₹) and OOP payment (in ₹) for breast cancer treatment by duration of treatment

Figure 3 presents the mean cost of treatment and OOP payment by duration of treatment. The mean cost of treatment for patients treated less than 9 months was ₹232,674 compared to ₹370,456 for patients treated more than 12 months. Moreover, the OOP payment for patients treated for more than 12 months was almost two times higher than that for patients treated less than 9 months. The cost and OOP payment increased linearly with duration of treatment.

Figure 4 compares our monthly average OOP payment for breast cancer treatment with that in USA and high-income countries (HIC). The monthly OOP payment for breast cancer treatment was higher in India (\$270) compared to that in USA (\$205) and other high-income countries (\$202). We have used the estimates of monthly OOP payment for USA and HIC from Irragori et al., 2021 and adjusted to 2020 USD prices (Irragori et al., 2021). The overall OOP expenditure for breast cancer treatment was ₹186,461 compared to ₹100,813 (as per 2020 INR prices) estimated for any cancer treatment from a previous study using NSS 2017-18 micro data (Goyanka, 2021). At the time of beginning cancer treatment, 38% of the patients had availed of loans for treatment, which increased to 65% during treatment and 69% at the time of their first follow-up visit.

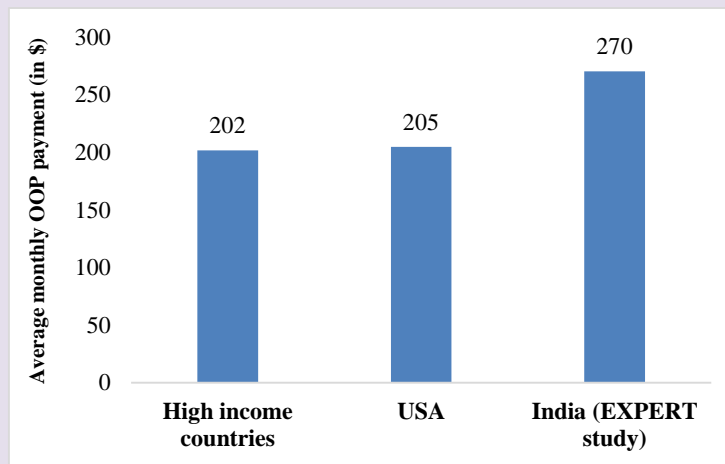


Figure 4: Comparison of average monthly OOP payment (in \$) for breast cancer treatment in India, USA and high income

Conclusion

Our findings suggested an earlier age of onset of breast cancer since the median age at diagnosis of breast cancer was 47 years, two decades lower than in developed countries. Besides early onset, about two-thirds of breast cancers were diagnosed at an advanced stage. Our estimated cost and OOP expenditure for breast cancer was much higher than available estimates, nationally and globally. Loans and debt of households increased during the course of treatment and also up to 6 months post treatment. Although the National Programme on Cancer Screening recommended screening for all women above 30 years, less than 1% of the eligible women in the 30-49 years age group were ever screened (Sen et al., 2022). It is recommended to increase awareness, early diagnosis, multi-disciplinary treatment and increase coverage of health insurance for breast cancer patients.

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