

Treatment Delay in Cancer Patients Attending a Tertiary Care Centre of North India: A Cross - Sectional Study

Running Title: Delay in Diagnosis and Treatment among Cancer Patients Attending a Tertiary Care Hospital in Northern India

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Abstract: ***Introduction:** The present study aims to explore the treatment delay in days (from initiation of signs and symptoms to start of definitive treatment) of oral cancer patients attending a tertiary care hospital in North India. **Method:** A descriptive hospital based cross-sectional study was conducted among 425 diagnosed cancer patients aged ≥ 18 years attending a tertiary care center of Lucknow district. A pre-designed and pre-tested structured questionnaire was used to collect information on the socio-demographic characteristics of the participants and factors causing delay in treatment initiation. Statistical analysis was done on Statistical package for social sciences, version 26 IBM, Chicago, USA. Descriptive data is represented as frequency percentage, mean SD or proportion. Probability (p) was calculated to test for statistical significance at the 5% level of significance. Association between categorical variables was tested using the Chi-Square and Fischer's Exact test. Mean, median and IQR of treatment was calculated by using Kruskal-Wallis and Mann Whitney test. A minimum 95% confidence interval or p value < 0.05 was considered as statistically significant. **Result:** Out of 425 study participants, 27.1 percent had oral cancer, 14.6 percent had blood cancer 14.4 percent had breast cancer, 11.8 percent had cervical cancer, 9.2 percent had lung cancer, and 23.1 percent had other cancers (colorectal, oesophageal etc). The mean time taken from identification of signs/symptoms to start of definitive treatment for oral cancer was 127.2 ± 77.3 days. **Conclusion:** This study reveals substantial delays between the identification of symptoms and the initiation of treatment, often spanning 25 months. These delays are strongly associated with socioeconomic factors such as low income, education levels, and initial healthcare contact. The findings underscore the urgent need to enhance primary healthcare services in India to facilitate early cancer diagnosis and reduce treatment delays, particularly in marginalized communities.*

Keywords: Cancer, delays, treatment

1. Introduction

The global burden of cancer is expected to climb dramatically by 2040, with forecasts predicting an alarming increase to 27.5 million new cases and 16.3 million deaths due to cancer, owing mostly to population growth and aging dynamics.¹ In India, the Indian Council of Medical Research (ICMR) anticipated that there will be around 1.7 million new cancer cases and 800,000 cancer-related deaths by 2020. Among the various types of cancer, the top five responsible for a significant number of deaths are breast, lip, oral cavity, cervix uteri, lung, and colorectal cancers. Uttar Pradesh stands out as one of the states in India that has been severely impacted, with a total of 674,386 cases reported. This is due to Uttar Pradesh

being one of the most populous states in India, along with having the greatest rate of tobacco consumption and its byproducts.² Research investigating treatment delays in various types of cancer is limited, despite the significant prevalence and effects of the disease. Analyzing treatment delays in different types of cancer within a single study can provide useful insights into similarities and differences, aiding in the development of more comprehensive approaches to cancer therapy.³ The current study was designed to evaluate and measure treatment delays among cancer patients to address a significant gap in the existing literature and enhance the understanding of cancer care processes.

2. Subjects and Methods

A descriptive cross-sectional study was conducted at a tertiary care hospital in Lucknow from December 2021 to November 2022. The study included diagnosed cancer patients aged 18 years and older. The study received ethical approval from the KGMU Institutional Review Board (IEC No. V-PGTSC-IIA/P10, 30/11/2021), and all subjects provided informed consent. The study was conducted at King George's Medical University in Lucknow, specifically in the outpatient departments (OPD) of surgical oncology, medical oncology, radiotherapy, and clinical hematology. Data were collected between March 2022 and September 2022. Convenient sampling, a type of non-probability sampling, was used to recruit six consecutive patients who met the inclusion criteria on alternate OPD days. A total of 425 cancer patients were interviewed for data gathering.

A pre-designed and pre-tested structured questionnaire consisting of 43 items was used to collect data. The questionnaire was translated from English to Hindi and then back-translated to assure linguistic and contextual accuracy. The data included socio-demographic characteristics (such as domicile, gender, marital status, family type, education level, family income, employment status), diagnosis details, and factors causing delays in cancer detection and treatment. The treatment delay was determined by calculating the mean, median, and standard deviation in days. The statistical analyses were conducted using the Statistical Package for Social Sciences, version 26 (IBM, Chicago, USA). The data was presented descriptively as frequency percentages, mean with standard deviation, or proportions. Statistical significance was assessed at the 5% significance level, with probability (p) values calculated accordingly. The Chi-Square test was utilized to analyze relationships between categorical variables, while Fischer's Exact test was applied in cases where the anticipated frequency in a certain cell was below 5. The Kruskal-Wallis and Mann-Whitney tests were used to determine the mean, median, and interquartile range (IQR) of treatment duration. Results were deemed statistically significant if they had a minimum 95% confidence interval or a p-value less than 0.05.

3. Results

Among the 425 study participants, oral cancer was the most common at 27.1%, followed by breast cancer (14.4%), lung cancer (9.2%), cervical cancer (11.8%), blood cancer (14.6%), and other forms of malignancies (23.1%) such as colorectal and esophageal cancers. [Figure 1]. Demographically, 50.1% of the participants were 46 years old or older, 13.2% were between 18 and 30 years old, and 36.7% were in the 31 to 45 ages. The mean age of all participants was 44.7 ± 11.6 years. The majority of participants classified themselves as belonging to the "other" category (40.5%), followed by SCs/STs (31.0%) and OBCs (28.5%). Approximately 70% of the participants came from rural areas, with the remaining 28.5% living in urban locales. The majority of participants (91.5%) were married, while only 8.0% were unmarried [Table 1].

Maximum treatment delay was found in those who had first health care contact at primary level (120, 78.7-180 days) and

minimum for those who had first contact at tertiary care level (55, 32.5-97.5 days) and it was found statistically significant. Treatment delay was found more in those who had delay after noticing the symptoms (130, 90-190 days) as compare to those who had no delay after noticing the symptoms (80, 44.3-138.8 days) and it was found statistically highly significant. Treatment delay was found more in those who had visited traditional healers (120, 81.3-170 days) before going to a hospital as compare to those who had not visited traditional healer (90, 44-195 days) and it was found statistically insignificant. Treatment delay was found more in those who used over the counter medicine (120, 88.8-182.5 days) as compare to those who had not used (80, 42-145 days) and it was found statistically significant. Treatment delay was found more in those who had disappointment due to longer time lag for consultation (170, 75- 220 days) as compare to those who had no disappointment (92.5, 66.3-143.7 days) and in those who had disappointment, treatment delay was found more in those who had worsen symptoms (92.5, 66.3-143.7 days) as compare to those who didn't (90, 60-145 days) and both were found statistically significant. [Table 2]

Treatment delay was more in those who had no awareness (110, 75-170 days) of cancer as compare to those who had (105, 57.5-190 days) and it was found statistically insignificant. Treatment delay was more in those who had not taken a second opinion (110, 70-180 days) as compare to those who had (95, 65-168.8 days) and it was found statistically insignificant.

Treatment delay was maximum in those who said it was incurable (55, 32.5-97.5 days) and minimum in those who said it was curable (55, 32.5-97.5 days) although it was found statistically insignificant. Maximum treatment delay was found in those who were have the opinion that cancer treatment was unaffordable (127.5, 88.8-202.5 days) and minimum in those who were have of the opinion that it was affordable (60, 37.5-120 days) and it was found statistically significant. Those who had fear of cancer treatment (120, 80-180 days) had more treatment delay as compare to those who didn't (80, 60-100 days) and it was found statistically significant. [Table 3]

4. Discussion

This cross-sectional study, conducted among 425 cancer patients in Lucknow district, Uttar Pradesh, sheds light on the prevailing treatment delays among cancer patients. Our data suggest significant delays in obtaining therapy among the study group.

5. Conclusion

Our study revealed a concerning trend wherein cancer patients experienced significant delays from the identification of signs/symptoms to the commencement of definitive treatment, spanning a mean duration of 2-5 months. We have concluded that these treatment delays are closely linked to socioeconomic characteristics such as poor household income, educational attainment, family structure, and the level of early healthcare contact, as well as barriers to accessing healthcare facilities.

Surprisingly, after being diagnosed, a significant proportion of patients had to wait more than three months before receiving definite cancer treatment, owing primarily to deficiencies in government hospital facilities. Given the rising incidence of cancer in India, immediate action is required to strengthen the primary healthcare system. Improving the accessibility and quality of primary healthcare services is critical to facilitating early cancer diagnosis and thereby avoiding treatment delays.

Policymakers must prioritize programs that strengthen existing health infrastructure and increase healthcare coverage, especially in marginalized areas. By building a strong primary healthcare ecosystem, we can promote earlier detection of cancer patients, improving the chances of good treatment outcomes and, eventually, reducing the cancer burden on society.

6. Limitations

While our study provides valuable insights into treatment delays among cancer patients, several limitations warrant

consideration. Firstly, the study was conducted exclusively within a tertiary care hospital setting, excluding patients receiving treatment from other healthcare facilities. As a result, the findings may not accurately reflect the larger population of cancer patients across various healthcare settings. Second, because to time and resource restrictions, patients were only included from three departments within the hospital. As a result, the study may not include all cancer patients treated at the institution. Additionally, the potential for recall bias cannot be discounted, as participants may have experienced difficulties accurately recollecting the duration of their treatment delays. Furthermore, to generalize the findings of this study to a broader population, larger-scale follow-up studies are warranted. Addressing these limitations through comprehensive and inclusive research endeavors will be crucial in advancing our understanding of treatment delays in cancer care and informing targeted interventions to mitigate this pressing issue.

Table 1: Association between socio-demographic characteristics of oral cancer patients and treatment delays (N=115)

Variables		Treatment delay (total delay in days)		*p value
		Median (IQR)	Mean ± SD	
Age groups (years)	18-30	67.5(22.5,78.7)	67.5±53.0	0.50
	>31-45	97.5(60,197.5)	134.2±93.4	
	≥46	120(77.5,170)	124±65.9	
Gender	Male	110(75,170)	127.4±76.9	0.32
	Female	90(61.3,203.8)	125±89.9	
Religion	Hindu	100(65,170)	121.7±72.7	0.11
	Muslim	135(82.5,237.5)	161.5±97.8	
Category	SCs/STs	120(70,187.5)	128±73	0.90
	OBCs	92.5(81.3,175)	126±73	
	Other	110(63.7,170)	127±82.6	
Residence	Rural	107.5(66.3,170)	123.4±71.9	0.14
	Urban	90 (70,170)	128.6±85.7	
	Urban Slums	265(150,255)	265±91.9	
Marital status	Married	110(72.5,175)	128.4±77.5	0.16
	Unmarried	60(22.5,67.5)	60±42.4	
	Divorced/ Widowed/Separated	-	-	
Education	Illiterate	112.5(81.3,211.5)	143±82.4	0.07
	Up to primary	150(100,200)	155±77.8	
	Middle-High School	90(60,150)	106.5±63.7	
	Intermediate	80(45,197.5)	116.5±99	
Occupation	Graduate & above	125(71.3,185)	132.4±66.2	0.38
	Professional	165(57.5,227.5)	150±89.8	
	Clerical (n=1)	165	165	
	Sales & Services	97.5(78.7,142.5)	106.9±44.3	
	Skilled manual	75(47.5,112.5)	88.4±57.2	
	Unskilled manual	110(60,200)	134.8±85.3	
#Socio- economic status	Agriculture	125(90,195)	143±74.3	0.005
	Unemployed	95(52.5,195)	132±106.7	
	Upper	55(22.5,60)	55±35.4	
	Upper Middle	60(30,75)	61.4±253	
	Middle	145(45,75)	150±95.4	
Type of family	Lower Middle	90(60,170)	113±72.3	0.01
	Lower	122(90,190)	142.6±76.4	
	Nuclear	90(60,150)	113.3±74.9	
	Joint	135(86.2,193.7)	144±77.7	

*Kruskal Wallis/Mann Whitney U test
Modified BG prasad classification

Table 2: Association between different factors and treatment delay in oral cancer patients (N=115)

Variables		Treatment delay (total delay in days)		*p value
		Median (IQR)	Mean± SD	
Level of first healthcare contact after noticing the symptoms	Primary	120(78.7,180)	134.5±75.4	0.02
	Secondary	105(80,177.5)	130.9±75.8	
	Tertiary	55(32.5,97.5)	86.5±84.5	
Delay in consultation after noticing symptoms	No	80(44.3,138.8)	97.2±66.3	<0.001
	Yes	130(90,190)	148.8±78	
Visit to traditional healers before going to a hospital	No	90(44,195)	122±93.5	0.11
	Yes	120(81.3,170)	130.7±64.5	
Use of over-the-counter medicines	No	80(42,145)	104.8±78.5	0.003
	Yes	120(88.8,182.5)	139.6±74.4	
Disappointment due to longer time lag for consultation/treatment	No	92.5(66.3,143.7)	109.5±58.3	0.006
	Yes	170(75,220)	161.8±97	
Symptoms worsen in this duration (n=)	No	90(60,145)	112±72.5	<0.001
	Yes	175(95,218.8)	166.6±76.7	

*Kruskal Wallis/Mann Whitney U test

Table 3: Association between participants perception about oral cancer and treatment delay (N=115)

Variables		Treatment delay (Total delay in days)		*p-value
		Median (IQR)	Mean ± SD	
Awareness about cancer related problems	No	110(75,170)	130.8±79.9	0.51
	Yes	105(57.5,190)	119.7±72.2	
Did you take a second opinion	No	110(70,180)	129.7±79.8	0.52
	Yes	95(65,168.8)	112±60.4	
Curability of cancer	Curable	80(45,157.5)	102.6±71.4	0.02
	Incurable	150(75,220)	154±80.9	
	Uncertain	110(83.7,172.5)	132.5±76.9	
Affordability of cancer treatment	Unaffordable	127.5(88.8,202.5)	146.5±81.3	0.002
	Affordable	60(37.5,120)	81.7±52.2	
	Unsure	90(61.3,150)	111.7±67.7	
Fear of cancer	No	80(60,100)	100.7±85.4	0.007
	Yes	120(80,180)	133.9±74.2	
Patient perception about counselling (n=)	Not done	110(77.5,175)	132.3±77	0.09
	Helpful	97.5(47.5,162.5)	109.4±71.1	
	Frightening (n=1)	30	30	

*Kruskal Wallis/Mann Whitney U test

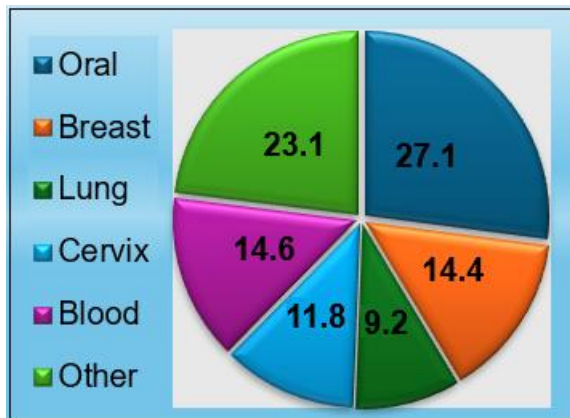


Figure 1: Distribution of different types of cancer in study participants

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