

Referral and treatment delay for breast cancer treated at a third level oncology hospital of IMSS, 2019-2020

Retraso en la referencia y el tratamiento por cáncer de mama en un hospital oncológico de tercer nivel del IMSS, 2019-2020

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Abstract

Objective: To compare the referral delay (Dref) and the treatment delay (Dtx) of workers with breast cancer (BrCa) treated at a third level oncology hospital (HOnco) in 2019 and 2020. **Methods:** A retrospective cohort study was carried out in workers who attended the HOnco in 2019 and 2020 diagnosed with BrCa. Both, the Dref and the Dtx were defined as the elapsed days from suspicion consultation until the referral to HOnco and from this to the beginning of treatment. The data was gathered from the clinical file. In order to compare the variables, χ^2 and U Mann y Whitney were used with $p \leq 0.05$. **Results:** With a total of 542 cases, the Dref was 21 days and the Dtx was 35 days. When comparing 2019 and 2020, significant differences were found in the Dref (17 vs. 24 days) advanced stage (32.2% vs. 51%) and primary private care (14.5% vs. 38.8%). **Conclusions:** Dref for BrCa was significantly higher for 2020.

Keywords: Breast cancer. Referral delay. Treatment delay. Temporary disability.

Resumen

Objetivo: Comparar el retraso en la referencia (Rref) y el retraso en el tratamiento (Rtx) de las trabajadoras con cáncer de mama (CaMa) tratadas en un hospital oncológico de tercer nivel (HOnco) en 2019 y 2020. **Métodos:** Se realizó un estudio de cohorte retrospectivo en trabajadoras con diagnóstico de CaMa que acudieron al HOnco en 2019 y 2020. El Rref y el Rtx se definieron como los días transcurridos desde la consulta de sospecha hasta el envío al HOnco y de este al inicio del tratamiento. Para comparar las variables se usaron χ^2 y U de Mann-Whitney, con $p \leq 0.05$. **Resultados:** En un total de 542 casos, el Rref fue de 21 días y el Rtx de 35 días. Al comparar 2019 y 2020 se encontraron diferencias significativas en Rref (17 vs. 24 días), estadio avanzado (32.2% vs. 51%) y atención privada previa (14.5% vs. 38.8%). **Conclusiones:** El Rref por CaMa fue significativamente mayor en el año 2020.

Palabras clave: Cáncer de mama. Retraso de referencia. Retraso de tratamiento. Incapacidad temporal para el trabajo.

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Introduction

Cancer is one of the greatest public health challenges. Breast cancer (BC) has a worldwide incidence of 47.8 per 100,000 inhabitants and a mortality rate of 13.6 per 100,000 inhabitants.¹ Survival in highly developed populations reaches 75-90%, whereas in less developed countries it is 47-76%.² In Latin America, it is more frequent in women aged 40 to 75 years.³ The *Instituto Mexicano del Seguro Social* (IMSS) reports that patients with BC are in stages III and IV in 57.5% of cases.⁴

Medical care at the IMSS

The IMSS divides medical care into 3 levels: the first provides comprehensive and continuous medical care to the patient; the second provides diagnostic, therapeutic, or rehabilitation care according to the patient's condition; and the third consists of highly specialised medical units, with advanced technology and maximum diagnostic and therapeutic resolution capacity.⁵ The referral and counter-referral system was created to facilitate the channeling of patients between levels of care, reducing waiting periods and administrative procedures.⁶

Nearly 40% of women diagnosed with BC are of productive working age; of these, nearly 80% are salaried employees,⁷ and the prescription of temporary work disability (TWD) is part of the treatment of insured women. In 2016, Campos Raymundo⁸ reported up to 504 days of TWD due to BC at the HONco.

Types of delay in the care of oncological diseases

Several published articles describe the problem of delay in cancer care, differentiating according to the place where the delay originates:

- Patient delay: the period during which the patient has symptoms but does not seek medical assessment.
- Medical delay: the period during which health personnel do not have an accurate diagnosis of the patient's disease.
- Referral delay (Rref): the period during which the first-contact physician refers the patient to the specialist physician.
- Treatment delay (Rtx): the period during which the patient waits from the consultation with the

specialist physician until the start of definitive oncological treatment.

- Health system delay: the period during which the processes and procedures of the system cause a delay before the patient receives oncological treatment.⁹

The objective of the study was to compare the Rref and Rtx of female workers with BC treated at an HONco in 2019 and 2020.

Methods

We conducted a retrospective analytical cohort study from January 2019 to December 2020 in women diagnosed with BC at the HONco. Records from that study period were reviewed for patients with this diagnosis who also had the 1F suffix in their social security number, which generally identifies women in the worker category; students or those who, upon verification, were not workers were excluded. The referral forms from the units to the HONco, known as “referral sheets”, were then searched, and those corresponding to patients treated at another third-level unit who attended the HONco only for complementary treatment were eliminated. Rref days were calculated from the date of referral to the date of the first consultation at the HONco, and Rtx days were calculated from that latter date to the date of the first day on which treatment was received. During these waiting periods, information on TWD was sought in a single subsidy and benefits system. Other data were searched for in the clinical record, such as age, clinical stage, histopathological diagnosis, medical care in the private setting, and types of treatment received. For quantitative variables, the Kolmogorov-Smirnov test was applied as a normality test, showing a non-normal distribution; these data were reported as median and interquartile range 25 to 75 (IQR₂₅₋₇₅). Qualitative variables were expressed as frequency and percentage. Hypothesis tests for 2 quantitative variables were performed using the Mann-Whitney U test, and hypothesis tests for 2 qualitative variables were performed using the chi-square test. A result was considered significant when the p value was < 0.05.

Results

A total of 542 female workers with BC were included, with a median age of 47 years (IQR₂₅₋₇₅: 41-54). The most frequent histological diagnosis was ductal carcinoma in 465 patients (86.2%). Clinical stage IIA was

the most frequent, reported in 154 patients (28.4%), followed by IIB in 103 patients (19%). It was identified that 72.8% of patients had received care for BC at another IMSS unit before arriving at the HONco, and 25.5% had received some form of care in a private setting. Regarding TWD data, 264 insured women (48.7%) had a disability period before their first consultation at the HONco, and the range of days granted was up to 18 days. When the patient started treatment, the number of TWD cases increased to 508 (93.7%), with a median of 9 days (IQR₂₅₋₇₅: 2-28). The treatment received upon arrival at the HONco was radiotherapy in 228 patients (42%), optimal medical therapy in 170 (31.4%), and surgical treatment in 144 (26.6%).

The number of days from referral to the first consultation at the HONco was 21 days (IQR₂₅₋₇₅: 12-34). The median number of days elapsed from the first consultation at the HONco to the start of any of the treatments was 35 days (IQR₂₅₋₇₅: 18.7-65.7) (Table 1).

When comparing 2019 and 2020, the latter during the COVID-19 pandemic, it was identified that in 2019 the median Rref was 17 days (IQR₂₅₋₇₅: 9-31), whereas in 2020 it was 24 days (IQR₂₅₋₇₅: 16-37; $p = 0.000$). Female workers with TWD in 2019 numbered 147 (43.5%), and in 2020 they numbered 117 (47.8%; $p = 0.687$). The days of TWD granted during the Rref period were similar in both years (IQR₂₅₋₇₅: 0-18 days for 2019 and 0-17 days for 2020; $p = 0.626$) (Table 2).

The median number of days elapsed from the first consultation at the HONco to the start of treatment was 37 days (IQR₂₅₋₇₅: 19-67) in 2019 and 35 days (IQR₂₅₋₇₅: 19-64; $p = 0.570$) in 2020. The TWD days granted to female workers during the Rtx period were 7 days (IQR₂₅₋₇₅: 2-28) in 2019 and 11 days (IQR₂₅₋₇₅: 3-28; $p = 0.011$) in 2020.

Regarding Rtx days by type of treatment, the most marked difference was observed in patients who received chemotherapy, since in 2020 the waiting time almost doubled (20 vs. 32 days). This was not the case for radiotherapy, for which the time was longer in 2019 (60 vs. 49 days; $p < 0.000$) (Table 3).

Cases were grouped into early stages (I, IIA, and IIB) and advanced stages (IIIA, IIIB, IIIC, and IV). In 2019, advanced stages accounted for 96 cases (32.3%), whereas in 2020 they accounted for 125 cases (51%; $p = 0.000$). For TWD days in early stages, an IQR₂₅₋₇₅ of 0-12 days was found, and in late-stage disease an IQR₂₅₋₇₅ of 0-24 days was found ($p = 0.000$). Patients were categorised according to the medical care received before referral into two groups. In the private service, there were 43 cases

Table 1. Sociodemographic, clinical, and temporary work disability characteristics in women with breast cancer

Variable	n (%) or IQR
Total	542
Age, years	47 (41-54)
Year of breast cancer diagnosis	
2019	297 (54.8)
2020	245 (45.2)
Histological diagnosis	
Ductal carcinoma	467 (86.2)
Lobular carcinoma <i>in situ</i>	29 (5.4)
Lobular carcinoma	28 (5.2)
Mucinous carcinoma	6 (1.1)
Papillary carcinoma	6 (1.1)
Medullary carcinoma	3 (0.6)
Metaplastic carcinoma	2 (0.4)
Intraductal carcinoma <i>in situ</i>	1 (0.2)
Tubular carcinoma	1 (0.2)
Clinical stage	
IA	64 (11.8)
IIA	154 (28.4)
IIB	103 (19.0)
IIIA	94 (17.3)
IIIB	61 (11.3)
IIIC	24 (4.4)
IV	42 (7.7)
Treatment received at the HONco	
Surgical treatment	144 (26.6)
Medical treatment	170 (31.4)
Radiotherapy	228 (42.0)
Care before referral	
IMSS	395 (72.8)
Private service	138 (25.5)
Ministry of Health	6 (1.1)
Other	3 (0.6)
Referral delay, days	21 (12-34)
Treatment delay, days	35 (18.7-65.7)
TWD during the referral delay	
Yes	264 (48.7)
No	278 (51.3)
TWD during the treatment delay	
Yes	508 (93.7)
No	34 (6.3)

HONco: Hospital de Oncología; IMSS: Instituto Mexicano del Seguro Social; TWD: temporary work disability; IQR: interquartile range.

(14.5%) in 2019 and 95 cases (38.8%) in 2020 ($p = 0.000$) (Table 4).

Discussion

The general characteristics of cancer are consistent with the global literature. The main histological diagnosis, according to Barraga-Ruiz et al.,³ is ductal

Table 2. Referral delay and history of temporary work disability in 2019 and 2020

Variables	2019	2020	p
Referral delay, days	17 (IQR ₂₅₋₇₅ : 9-31)	24 (IQR ₂₅₋₇₅ : 16-37)	0.000
Temporary work disability during referral delay			0.687
Yes	147 (43.5%)	117 (47.8%)	
No	150 (56.5%)	128 (52.2%)	
Duration of temporary work disability during referral delay, days	0 (IQR ₂₅₋₇₅ : 0-18.5)	0 (IQR ₂₅₋₇₅ : 0-17)	0.626

TWD: temporary work disability; IQR: interquartile range.

Table 3. Treatment delay and history of temporary work disability in 2019 and 2020

Variables	2019	2020	p
Treatment delay, days	37 (IQR ₂₅₋₇₅ : 19-67)	35 (IQR ₂₅₋₇₅ : 19-64)	0.570
Temporary work disability during treatment delay			0.045
Yes	284 (95.6%)	224 (91.4%)	
No	13 (4.4%)	21 (8.6%)	
Duration of temporary work disability during treatment delay, days	7 (IQR ₂₅₋₇₅ : 2-28)	11 (IQR ₂₅₋₇₅ : 3-28)	0.011
Treatment time, days			0.00
Surgical	49 (IQR ₂₅₋₇₅ : 30-70)	60 (IQR ₂₅₋₇₅ : 14-46)	
Medical	20 (IQR ₂₅₋₇₅ : 23-88)	32 (IQR ₂₅₋₇₅ : 20-87)	
Radiotherapy	49 (IQR ₂₅₋₇₅ : 10-37)	33 (IQR ₂₅₋₇₅ : 20-51)	

TWD: temporary work disability; IQR: interquartile range.

Table 4. Comparison of breast cancer care in 2019 and 2020

Variables	2019	2020	p
Clinical stages, n (%)			0.000
Early	201 (67.7)	120 (49)	
Advanced	96 (32.3)	125 (51)	
Previous care, n (%)			0.00
Private medical service	43 (14.5)	95 (38.8)	
IMSS and public institutions	254 (85.5)	150 (61.2)	

IMSS: Instituto Mexicano del Seguro Social.

carcinoma, of which we found a frequency of 86.2%. The most frequent clinical stage was IIA in both years, at 28.4%, considering that the hospital is a third-level centre.

The age reported in the national literature is 40 to 75 years. The age range of the female workers in this analysis was 41 to 54 years, with a minimum of 18 and a maximum of 77 years.³

The Rref time was 21 days, which exceeds the opportunity days for referral for treatment mentioned in NOM-041-SSA1-2011,¹⁰ which indicates that it should be 10 days. We found that it was longer in 2020, which could be due to the difference in medical care during that year because of the COVID-19 health contingency, since medical care received by patients at an IMSS unit was up to 72.8%. However, in 2019, medical care in the private medical service was 14.5%, and in 2020 it was up to 38.8%. When performing the Spearman test, we found a positive and significant correlation between Rref and clinical stage, but not between type of care and clinical stage or Rref. The factors that influenced the identification of more advanced clinical stages between the 2 years were not an objective proposed in the study, but they could be addressed in other investigations. When comparing Rref with that reported by Allgar and Neal,⁹ who conducted a questionnaire in England among patients with various types of cancer, including BC, and found 13.2 days, even this value is above that established in NOM-041-SSA1-2011. Therefore, it would be important to reconsider these cut-off points to establish the timeliness of referral for this disease, generating real indicators that guide institutions' efforts to reduce them to a minimum for the benefit of the health of patients with BC.

Regarding the clinical stages of BC received at the HOnco, in 2019 a higher percentage of patients was observed in early stages, with 83.5%, and 16.5% in advanced stages; in 2020, these figures were 68.2% and 31.8%, respectively. As mentioned by Vanni et al.¹¹ in a cross-sectional study in which they administered a questionnaire to patients with BC in Rome, patients in isolation presented sentinel lymph node involvement more frequently than those from the previous year, and this will have long-term repercussions. Maringe et al.,¹² who collected information from medical records and compared pre-pandemic data with data during the pandemic, also reported that there will be an increase in deaths per year due to cancer diagnosis. The clinical stage of the disease also played an important role in disability, since a greater number of TWD days was reported in patients with advanced stages.

Medical care received by patients was provided at an IMSS unit in up to 72.8% of cases. However, in

2019, medical care in the medical service was 14.5%, and in 2020 it reached 38.8% of insured women, playing an important role in diagnosis.

Rtx had a median of 35 days, and NOM-041-SSA1-2011 states that treatment in an oncology centre should begin in < 15 days.¹⁰ The TWD time while waiting to receive some form of treatment was 8 days in 2019 and 16 days in 2020, a statistically significant difference. The number of days exceeding the standard has repercussions on the prescription of disability and, therefore, on cost. A study conducted by *Instituto Nacional de Cancerología* in 2012 through a questionnaire administered to patients reported an Rtx of 141 days. This was not the case in the present study, since the data were obtained from primary sources, avoiding the risk of recall and measurement bias.¹³

The Rtx time varied according to the type of treatment. For medical treatment (chemotherapy), the median was 28 days; in the different medical notes, a delay was found in the performance of the interconsultation by the breast tumour service. The radiotherapy service had a median of 33 days, and in the review of the clinical record it was found that those patients referred from the second level still had a pending chemotherapy cycle, delaying the start of radiotherapy, and that the large number of patients attending this unit only for radiotherapy made the wait to start treatment longer. Surgical Rtx had a median of 51 days; procedures were affected by the performance of studies such as slide review, genotype expression, and laboratory and imaging studies. The comparison between 2019 and 2020 showed an increase in days for medical treatment and surgical treatment. Papautsky and Hamlish¹⁴ administered a questionnaire to patients and found that 30% perceived a delay in therapeutic care.

TWD time had a median of 9 days for optimal medical therapy and 14 days for radiotherapy, due to treatment effects rather than clinical stage.

Among the limitations of the study, the type of population included should be noted, since, as patients considered active workers, there are likely to be important differences compared with the rest of the patients with BC, mainly in the variable analysed regarding prior care in a private setting, since this was a group that was able to meet this need by its own means, especially in 2020, when we can consider that fear of COVID-19 infection led them to attend private and less crowded places. Likewise, because this was a third-level hospital, external validity is limited.

Conclusions

BC is a disease in which timely diagnosis is the best way to reduce mortality; therefore, the performance of a greater number of screening studies should be prioritised at the first level of care. Rref and Rtx are greater than those reported in other countries and exceed the days referred to in the regulations. For 2020, the greatest backlog was found, leaving a large workload for the following years in the different oncology services, both for this cancer and probably for the rest of cancers. The results indicate that strategies to improve the care of patients with BC should be reinforced by shortening the waiting time for consultation with the oncology specialist and the time required to perform the complementary diagnostic studies needed for therapeutic decision-making. This will also have an effect on reducing TWD days, giving female workers a greater opportunity to return to work.

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Conflicts of interest

The authors declared no conflicts of interest regarding the research or publication of this article.

Ethical considerations

Protection of human subjects and animals. The authors declare that the procedures followed conformed to the ethical standards of the responsible human experimentation committee, in accordance with the World Medical Association and the Declaration of Helsinki. The procedures were authorised by the institution's Ethics Committee.

Confidentiality, informed consent, and ethical approval. The authors obtained approval from the Ethics Committee for the analysis of routinely obtained and anonymised clinical data. Due to the nature of the study, individual informed consent was not required. The relevant ethical recommendations were followed.

Declaration on the use of artificial intelligence. The authors declare that no type of generative artificial intelligence was used for the writing or creation of content for this manuscript.

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