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Breast cancer management during the COVID-19 pandemic: Report from a General Hospital Based Cancer Registry from 2019 to 2022

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Abstract

Purpose: This study aimed to describe breast cancer management during the COVID-19 pandemic.

Methods: This research is a retrospective descriptive study using secondary data from medical records. The study included 70 patients with breast cancer at Dr. M. Djamil General Hospital from March 2019 to December 2022, who met the inclusion and exclusion criteria. The data analysis used is univariate analysis and presented in the form of a frequency distribution table so that a descriptive picture of each variable studied is obtained.

Results: This study included 70 patients with mean age of 40.91 years. During the pandemic, 60.0% of the patients visited the surgical polyclinic. Half of the breast cancer patients had a secondary diagnosis such as pleural effusion (28.6%). The majority of the subjects were at stage IIIC (32.9%). More than half (51.4%) of the patients underwent a modified radical mastectomy. The most common pathological anatomy diagnosis was invasive carcinoma mammae NST (47.1%). An Immunohistochemistry examination was conducted on 24 (34.3%) subjects. Less than half of the patients received chemotherapy. The majority of the patients underwent surgery and chemotherapy 1 month after diagnosis. Mortality is seen in 8.7% of breast cancer patients.

Conclusion: During the COVID-19 pandemic, the majority of breast cancer patients undergo anatomical pathology and immunohistochemistry examination through the surgical polyclinic, breast cancer patients who come to the emergency department are usually admitted with breathing problems due to pleural effusion, and surgery and chemotherapy are performed within 1 month.

Keywords: Breast cancer; COVID-19; Management; Pandemic; General hospital

1. Introduction

Carcinogenesis is the process by which normal cells transform into cancer cells. The multifactorial process that causes carcinogenesis is primarily triggered by both genetic predispositions and environmental factors. Apoptosis evasion, an infinite capacity for dividing themselves, increased angiogenesis, resistance to anti-growth signals, activation of own growth signals, and metastasis are the main processes that allow it to progress [1–3].

For women around the world, breast cancer is the most prevalent malignant tumor. Approximately about 36% of individuals with cancer are breast cancer patients. Recent GLOBOCAN 2020 data estimated 2.3 million new cases of

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breast cancer. Because of its high death and morbidity rates, it is a major health problem for women. Even with adjuvant chemotherapy, the five-year survival rate for metastatic breast cancer is less than 30% [4–6].

Various factors such as early menarche, late menopause, late age at first pregnancy, and low parity can increase breast cancer risk. Age is a significant risk factor for breast cancer, with women over 40 being nearly 1.9 times more susceptible compared to women under 40. Other factors that may increase the risk of breast cancer include high hormone levels, race, economic status, and iodine deficiency in the diet [5,7,8].

Breast cancer can be classified into different subtypes based on various factors. The most common classification system is the molecular classification system, which divides breast cancer into five groups: luminal A, luminal B, HER-2, basal, and normal breast-like. Another classification system is the TNM classification system, which groups patients into four-stage groupings based on the primary tumor size, the regional lymph node status, and if there is any distant metastasis [9–12].

Diagnosis of breast cancer can be done through various methods such as breast examination, mammography, breast ultrasound, MRI, and other imaging modalities. The only definitive method for diagnosing breast cancer is with a breast biopsy. To increase diagnostic accuracy and eliminate as many false negative results as possible, clinical breast examination, breast imaging, and biopsy are performed simultaneously (triple test). Needle biopsy is used to diagnose breast cancer, which includes fine needle aspiration cytology (FNAC) and core needle biopsy [13,14].

A Combination of surgery, chemotherapy, radiation, hormone therapy, and targeted therapy is an option for breast cancer treatment. The choice of treatment depends on several factors, including the stage of the cancer, the patient's age and overall health, and the presence of certain genetic mutations. Clinical trials are also available for patients with different stages of breast cancer. Breast-conserving therapy (BCT) and mastectomy are both well-established local therapies for invasive breast cancer. Chemotherapy, hormone therapy, and targeted therapy are the systemic therapies used in breast cancer management. The most common chemotherapy regimens include cyclophosphamide and doxorubicin for four cycles followed by paclitaxel for four cycles. Surgery, radiotherapy, and chemotherapy are complementary strategies in the treatment of breast cancer [14–16].

The prognosis of breast cancer greatly depends on early care of the disease. However, the COVID-19 pandemic has caused delays in breast cancer detection and treatment in some countries. The Indonesian Ministry of Health published regulation concerning Large-Scale Social Restrictions (PSBB) on April 3, 2020. The government has implemented this regulation as a strategic measure to expedite the management of Corona Virus Disease 2019 (COVID-19). In this instance, restrictions include closing schools and workplaces, prohibiting religious activities, prohibiting activities in public spaces and facilities, prohibiting sociocultural activities, limiting transportation, and imposing restrictions on defence and security-related matters. As a result, the pandemic caused significant adjustments to medical procedures [17,18]. This study aimed to describe breast cancer management during the COVID-19 pandemic.

2. Materials and methods

2.1. Study Design and Population

This study is a descriptive retrospective study with a total sampling technique using secondary data from medical records with a sample size of 70 patients with breast cancer in Dr. M. Djamil General Hospital from March 2019 to December 2022 that meet the inclusion and exclusion criteria.

The inclusion criteria were as follows: a patient diagnosed with breast cancer and admitted to Dr. M. Djamil General Hospital from March 2019 to December 2022. The exclusion criteria are as follows: patients diagnosed with breast cancer who are hospitalized for treatment of conditions unrelated to breast cancer.

2.2. Procedures

Data collection was conducted at Dr. M. Djamil General Padang General Hospital through the results of observation of medical record data of patients with a diagnosis of breast cancer who met the inclusion and exclusion criteria.

2.3. Sample Size and Statistical Analysis

The sample size was determined based on the purpose of the study, describing breast cancer management during the COVID-19 pandemic at Dr. M. Djamil General Hospital in the period 2019 – 2022. From the results of the study Usman et al obtained the prevalence of breast cancer was 24%. The data analysis used is univariate analysis to describe the

characteristics of each variable. The analyzed data will then be presented in the form of a frequency distribution table so that a descriptive picture of each variable studied is obtained.

3. Results

This study examined breast cancer management in 70 female patients during the COVID-19 pandemic at Dr. M. Djamil General Hospital in the period 2019 - 2022. Table 1 shows that the patient's mean age was 40.91 ± 10.24 years. During the pandemic, more than half (60.0%) of the patients came to the surgical polyclinic and 28 patients (40.0%) came to the emergency department. Half of the breast cancer patients came with a secondary diagnosis such as pleural effusion (28.6%), chronic kidney disease (5.7%), anemia (4.3%), hypertension (2.9%), diabetes (2.9%), congestive heart failure (1.4%), ulcer (1.4%), fracture (1.4%), and sepsis (1.4%). Most of the subjects were stage IIIC (32.9%), followed by stage IV (27.1%), stage IIIA (14.3%), stage IIB (11.4%), stage IIIB and IA (2.9%), and stage IB and IIA (1.4%) (Table 1).

Table 1 Clinical characteristics (N=70)

Clinical Characteristics	**N (%)**
Age (mean ± SD)	40.91 ± 10.24
Entry Point	
Emergency department	28 (40.0%)
Surgical polyclinic	42 (60.0%)
Secondary Diagnosis	
Pleural effusion	20 (28.6%)
Anemia	3 (4.3%)
Hypertension	2 (2.9%)
Diabetes	2 (2.9%)
Chronic kidney disease	4 (5,7%)
Congestive heart failure	1 (1.4%)
Ulcer	1 (1.4%)
Fracture	1 (1.4%)
Sepsis	1 (1.4%)
Stage	
IA	2 (2.9%)
IB	1 (1.4%)
IIA	1 (1.4%)
IIB	8 (11.4%)
IIIA	10 (14.3%)
IIIB	2 (2.9%)
IIIC	23 (32.9%)
IV	19 (27.1%)

Invasive carcinoma mammae NST were the majority (47.1%) pathological anatomy diagnosis found in the patients, followed by invasive lobular carcinoma mammae (11.4%), and invasive ductal carcinoma mammae (2.9%). There are only a few patients diagnosed with mucinous carcinoma mammae, ductal in situ carcinoma mammae, and mixed invasive NST & lobular carcinoma mammae. Only 24 (34,3%) subjects undergo immunohistochemistry examination.

Table 2 Examination (N=70)

Examination	**N (%)**
Pathological Anatomy Diagnosis	
Invasive ductal carcinoma mammae	2 (2.9%)
Invasive carcinoma mammae NST	33 (47.1%)
Invasive lobular carcinoma mammae	8 (11.4%)
Mucinous carcinoma mammae	1 (1.4%)
Ductal in situ carcinoma mammae	1 (1.4%)
Mixed invasive NST & lobular carcinoma mammae	1 (1.4%)
IHK	24 (34.3%)

More than half (51.4%) of the patients underwent modified radical mastectomy procedure, 10.0% of subjects underwent wide excision and open biopsy, 2.9% underwent a simple mastectomy and classic radical mastectomy, and only 1 patient underwent breast-conserving surgery. Less than half of the patients treated with chemotherapy, 8 (11.4%) subjects underwent neoadjuvant chemotherapy, and 22 (31.4%) underwent adjuvant chemotherapy (Table 3).

Table 2 Procedure (N=70)

Procedure	**N (%)**
Surgical Procedure	
Modified radical mastectomy	36 (51.4%)
Simple mastectomy	2 (2.9%)
Classic radical mastectomy	2 (2.9%)
Wide excision	7 (10.0%)
Open biopsy	7 (10.0%)
Breast conserving surgery	1 (1.4%)
Chemotherapy	
Neoadjuvant	8 (11.4%)
Adjuvant	22 (31.4%)

The majority of the patients, underwent surgery 1 month after diagnosis (45.7%), with the longest waiting time for surgery being 6 months. For chemotherapy, the patient's wait time was 1 (11.4%) to 2 months (10.0%). During the pandemic mortality was found in 9 (8.7%) breast cancer patients (Table 4).

Table 4 Time to Treatment and Mortality (N=70)

Time to Treatment and Mortality	**N (%)**
Time from Diagnosis to Surgery (months)	
1	32 (45.7%)
2	2 (2.9%)
3	1 (1.4%)
6	2 (2.9%)
Time from Diagnosis to Chemotherapy (months)	

1	8 (11.4%)
2	7 (10.0%)
3	2 (2.9%)
Mortality	
Yes	9 (8.7%)
No	61 (87.1%)

4. Discussion

This study has the subject's mean age of 40.91 ± 10.24 years. This finding is lower than Adachi *et al.* (2023) with subject's mean age during the pandemic being 61.6 years. Negrao *et al.* (2022) also found more subjects in the age group 50 – 69 years, with a mean age of 57.5 years. According to Negrao et al. other studies saw a more notable decline in the screening target group of women, who were between the ages of 50 and 74. Literature states that approximately 80% of breast cancer patients are currently over 50, and over 40% are over 65. There is a progressive increase in the chance of breast cancer with age: 1.5% at age 40, 3% at age 50, and almost 4% at age 70. Differences observed in this study might result from the societal opinion that hospitals pose a significant risk of COVID-19 transmission. People who were younger than 20 and older than 65 were prohibited from leaving the house[19–21].

During the pandemic, more than half (60.0%) of the patients came to the surgical polyclinic and 28 patients (40.0%) came to the emergency department. There has been some published early research on how the COVID-19 pandemic restrictions have affected access to care and/or breast cancer screening. There was a decrease in mammography screening in 2020 when the epidemic first started. In the 2020 shelter-in-place era, two studies found a higher proportion of higher-stage or symptomatic illness. A study by Koca *et al.* (2021) discovered that during the pandemic, patients who visited breast outpatient clinics decreased by 26.3%. However, operations such as surgeries and outpatient clinics carried on as usual. During preoperative preparation, all patients were screened for COVID-19 using polymerase chain reaction (PCR) during the pandemic. Following COVID-19 medication, three patients whose PCR results were positive underwent surgery[21,22]

Half of the breast cancer patients came with a secondary diagnosis such as pleural effusion (28.6%), chronic kidney disease (5.7%), anemia (4.3%), hypertension (2.9%), diabetes (2.9%), congestive heart failure (1.4%), ulcer (1.4%), fracture (1.4%), and sepsis (1.4%). Liu *et al.* (2024) state in their study that 54.75% of the patients, had one or more underlying medical disorders; the most prevalent ones were anemia (21.17%), hypertension (21.90%), and hypoalbuminemia (25.55%). The majority of radiological results (34.31%) showed bilateral pneumonia, whereas a small number of cases also showed unilateral pleural effusion (4.38%) and bilateral pleural effusion (13.14%)[23].

Most of the subjects were stage IIIC (32.9%), followed by stage IV (27.1%), stage IIIA (14.3%), stage IIB (11.4%), stage IIIB and IA (2.9%), and stage IB and IIA (1.4%). This aligns with findings from a study in Lampung, where visits from breast cancer patients mostly high grades during COVID-19 (77.8%) and similar to findings from Usman *et al.* (2021) with the majority of the patients were stage IIIB (66.6%) followed by stage IV (12.1%). According to Malmgren *et al.* (2023), due to the suspension and limitation of non-essential screening in Washington State during the peak pandemic period, Q2-Q4 of 2020, saw a fall in case volume as well as a numerical and proportional decrease in stage 0/I BC compared to stage II-IV BC. The trend of fewer stage 0 and I breast cancer diagnoses was reversed in 2021 with increased access to mammography screening; nonetheless, the number of cases remained lower than pre-pandemic levels in 2019[22,24]

More than half (51.4%) of the patients underwent modified radical mastectomy procedure, 10.0% of subjects underwent wide excision and open biopsy, 2.9% underwent a simple mastectomy and classic radical mastectomy, and only 1 patient underwent breast-conserving surgery. Usman *et al.* (2021) showed that 66.0% of the subjects underwent a simple mastectomy and only 0.9% of subjects underwent modified radical mastectomy. Breast-conserving surgery, or BCS, and mastectomy are the two main surgical techniques that allow the excision of breast malignant tissues. BCS, also known as a quadrantectomy, wide local excision, lumpectomy, or partial/segmental mastectomy, allows for the removal of malignant tissue while simultaneously preserving healthy breast tissue. Oncoplasty, a plastic surgical technique, is frequently used in conjunction with BCS. A mastectomy involves removing the entire breast, and it is frequently followed by quick breast reconstruction[24,25]

Invasive carcinoma mammae NST were the majority (47.1%) pathological anatomy diagnosis found in the patients, followed by invasive lobular carcinoma mammae (11.4%), and invasive ductal carcinoma mammae (2.9%). There are only a few patients diagnosed with mucinous carcinoma mammae, ductal in situ carcinoma mammae, and mixed invasive NST & lobular carcinoma mammae. Only 24 (34,3%) subjects undergo immunohistochemistry examination. Nurmayeni *et al.* (2023) showed a different finding in the study, most of the subjects' types (90.1%) were invasive ductal carcinoma, followed by invasive lobular carcinoma (3.7%), and mixed invasive carcinoma (6.2%). There are at least eighteen distinct histological forms of breast cancer recognized by the World Health Organisation (WHO). The most common category (40–80%) is invasive breast cancer of no special type (NST), originally known as invasive ductal carcinoma. When a tumor cannot be identified as belonging to one of the histological special types, it is automatically diagnosed as this type. Cytological characteristics and unique development patterns are found in 25% of invasive breast tumors. Consequently, they are identified as particular subtypes (e.g., tubular, invasive lobular carcinoma, neuroendocrine, mucinous A, and mucinous B [25,26]

Less than half of the patients treated with chemotherapy, 8 (11.4%) subjects underwent neoadjuvant chemotherapy, and 22 (31.4%) underwent adjuvant chemotherapy. Different from Usman *et al.* (2021) where 93.9% of the subjects had a neoadjuvant chemotherapy history. Chemotherapy can be either an adjuvant or neoadjuvant systemic treatment for BC. The best option is determined by analyzing the unique characteristics of the breast tumour; in cases of secondary breast cancer, chemotherapy may also be utilized. Neoadjuvant chemotherapy can be administered intravenously or orally, and it is used for locally advanced breast cancer (BC), inflammatory breast cancers, downstaging large tumors to allow for BCS, or in small tumors with worse molecular subtypes (HER2 or TNBC) that can help identify prognostics and predictive factors of response. Nowadays, schemes 2-3 of the following medications are applied concurrently as part of the treatment: carboplatin, cyclophosphamide, 5-fluorouracil/capecitabine, taxanes (paclitaxel, docetaxel), and anthracyclines (doxorubicin, epirubicin)[24,25]

The majority of the patients, underwent surgery 1 month after diagnosis (45.7%), with the longest waiting time for surgery being 6 months. This study has a shorter waiting time than Usman *et al.* (2021) has the longest waiting time from diagnosis to surgery was 18 months. While the waiting time for surgery after neoadjuvant chemotherapy was 1 to 10 months. For chemotherapy, the patient's wait time was 1 (11.4%) to 2 months (10.0%). During the pandemic mortality was found in 9 (8.7%) breast cancer patients. The pandemic affected cancer control efforts, necessitating the development of plans to lessen the burden of potential delays in diagnosis and treatment. International medical societies have released recommendations on how to care for cancer patients during the pandemic. These guidelines include advice on preventing COVID-19, the necessity of reducing hospital visits, and the use of strategies to limit the movement of affected individuals. Some of these strategies include telemedicine, giving oral medications for at least three cycles of treatment, and interrupting or postponing treatment while weighing the risks and benefits on an individual basis[24,27]

The limitation of this study is that the authors did not describe the management of breast cancer patients before the pandemic. Therefore, we cannot fully understand the changes that occurred before and during the pandemic. Additionally, there are only a few patient records that provide comprehensive information about examinations and treatments due to the early and ongoing management being in their respective regional hospital.

5. Conclusion

During the COVID-19 pandemic, the majority of breast cancer patients undergo anatomical pathology and immunohistochemistry examination through the surgical polyclinic, breast cancer patients who come to the emergency department are usually admitted with breathing problems due to pleural effusion, and surgery and chemotherapy are performed within 1 month.

Compliance with ethical standards

Disclosure of conflict of interest

The author(s) do not have any conflicts of interest to declare.

Statement of ethical approval

The protocol for this study was approved by the Institutional Review Board of M. Djamil Hospital (No. LB.02.02/5.7/351/2022).

Statement of informed consent

Before being recruited as a subject, patients and/or their legal representatives were provided with informed consent.

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