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Cost Compliance Analysis of Real Therapy and INA-CBG's of Chemotherapy Breast Cancer Inpatien At 2017 Dr. Moewardi Surakarta Hospital

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ABSTRACT
INA-CBG's is used as a JKN package tariff system, the amount is sometimes not in accordance with the real costs incurred by the hospital so that the difference occurs. The purpose of this research is to find out the cost of the cytostatic therapy, to know the difference between the real cost and INA-CBG's rates and the factors that influence the real cost of breast cancer therapy in Dr. Moewardi Surakarta in 2017. Observational research using a restrospective design from a hospital perspective. Samples of all claim files and medical records of breast cancer chemotherapy patients with codes C-4-13-I, C-4-13-II, and C-4-13-III in 2017. Analysis of the suitability of the cost of therapy with INA-CBG's rates with one sample t-test and factors that influence the cost of therapy with multivariate analysis. The results showed there were 113 treatment episodes of 72 patients, of which women aged <45 years were most affected. Difference between the real cost of hospitalized breast cancer and INA-CBG's rates in class 3 treatment C-4-13-I severity level Rp. -62,187,362, C-4-13-II of Rp. 6,159,896, C-4-13-III Rp. 64,042,570. Based on all severity values P <0.05, means the average cost of treating breast cancer with all different severity levels based on INA-CBG's 2016 rates. The results showed the correlation test for age, severity, and LOS had a P value> 0.05, means the results of the analysis of these factors do not significantly influence the real cost of breast cancer therapy.

Keywords: National Health Insurance, INA-CBG's, Breast Cancer

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BACKGROUND

Cancer is a disease in which there is an abnormal and uncontrolled growth of body tissue cells. Breast cancer is a malignant neoplasm that originates from the parenchyma. Breast cancer is a health problem caused by the growth of breast tissue, both lobules / ducts, out of control, causing massive changes in both physiological function and histological structure. The incidence rate of breast cancer based on RESEARCH (2013) 1.4 / 1000 people with cancer (330,000 people), based on SIRS (2014) breast cancer patients were 12,014 cases, and based on a preliminary survey at RSUD Dr. Moewardi Surakarta (2016) contained ± 1,815 cases. Cancer therapy is carried out in 3 ways, namely surgery, radiation and chemotherapy. In surgery and radiation therapy is only local, if the diagnosis has spread, therapy often fails to eliminate completely.

Cytostatics is a treatment to kill cells fractionally, so that it is 90% successful and 10% unsuccessful. Administration in breast cancer patients varies depending on the chemotherapy regimen (type and dose of cytostatic drugs), the time interval for drug administration, the number of therapy cycles undertaken, side effects and toxicity due to chemotherapy use. Determination of the stage of breast cancer can be done by clinical stage (physical examination, biopsy, and imaging tests) and petalogik stage (clinical staging accompanied by surgery). The American Joint on Cancer (AJC) classifies stages based on TNM. T (tumor) size and extent of spread, N (lymph node spread), M (metastatic) spread to other organs. The high real costs will result in the high use of consumables, drug costs, supporting examinations, accommodation costs and doctor visits. Apart from these factors the type of treatment class, severity, and LOS also influence it.

The problems studied are how the cytostatic therapy regimen and chemotherapy costs are described, whether there is a difference between the real therapy costs and the INA-CBG rates and what factors affect the real therapy costs in patients. The purpose of this study was to describe the cytostatic therapy regimen and costs used, to know the difference between real therapy costs and INA-CBG rates, to find out the factors that influenced the real therapy costs of inpatients of JKN inpatient breast cancer at RSUD Dr. Moewardi Surakarta.

METHODS

This type of research was observational with a cross sectional study design according to the perspective of the hospital. The data collection method was carried out retrospectively, namely from tracing the patient's medical record documents and data on the treatment of breast cancer inpatients at Dr. Moewardi Surakarta. The tools used were data retrieval form sheets designed in accordance with research needs, writing instruments for recording and calculating tools. The material used is a medical record sheet with the diagnosis of breast cancer inpatients at the Regional General Hospital Dr. Moewardi Surakarta in 2017. The course of the research includes 4 stages, namely the stages of preparation, data collection, implementation, management and data analysis

RESULTS

The results showed 100% of breast cancer suffered by women. In line with Galih's (2015) research. According to Anonymous (2004), breast cancer can occur in men and women, but generally occurs in women with a ratio of 100: 1. The Ministry of Health (2009) released that women have a higher risk of developing breast cancer, this is related to hormonal and reproductive factors.

Characteristics of breast cancer patients at Dr. Moewardi Surakarta can be seen in table 1.

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Table 1. Characteristics of breast cancer patients with the code INA-CBG's C-4-13-I / II / III at Dr. Moewardi Surakarta for the period of January-December 2017

Patient characteristics	Number of patients	Percentage (%)
Age		
<45	23	31,94
46-55	22	30,56
56-65	21	29,17
>66	6	8,33
Gender		
Man	-	-
Women	72	100
Stadium		
I	2	2,78
II	17	23,61
III	26	36,11
IV	19	26,39
Unknow	8	11,11
Severity		
C-4-13-I	55	48,67
C-4-13-II	23	20,36
C-4-13-III	35	30,97
Number of secondary diagnoses		
Secondary diagnosis C50.9	90	79,65
1 secondary diagnosis other than C50.9	15	13,27
> 2 secondary diagnoses C50.9	8	7,08
Number of procedures (other than 99.25)		
1 procedure 99.25	75	66,38
2 procedure	23	20,35
>2 procedure	15	13,27

At the age <45 years had the highest percentage (31.94%), due to that age range menopause, weight gain, a history of cancer and other risk factors. This is in line with Lumowa's (2015) research. The stage level affects the outcome of therapy. The earlier the stage is detected and treated, the greater the recovery. In this study, stage III had the largest percentage (36.11%) and stage I had the lowest percentage (2.78%), this happened because the patient's awareness to treat early symptoms / at an early stage was still low and RSUD Dr. Moewardi is a type A hospital so that many referrals come from the Surakarta, Central Java and East Java areas. This is in line with the research of Budiningsih (2005).

Based on the severity level, they are grouped into 3, namely C-4-13-I (mild), C-4-13-II (moderate), and C-4-13-III (severe). The I severity level (48.67%) had a greater percentage than the II and III severity levels. This can happen because of the influence of secondary diagnoses and in Dr. Moewardi is a referral for JKN patients. The low number of episodes of treatment at severity levels II and II is due to the intensive handling of the treatment process so as to prevent metastases in cancer cells and reduce the number of complications suffered by patients. Secondary diagnosis is a co-diagnosis besides chemotherapy (Z511), the number of secondary diagnoses affects the severity and INA-CBG's fare difference

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Table 2. Characteristics of LOS distribution of patients with the code INA-CBG's C-4 -13-I / II / III who are hospitalized in Dr. Moewardi Surakarta during the period January-December 2017

Severity	Maintenance episodes	Min (day)	Max (day)	Rerata ±SD
C-4-13-I	55	1	1	1±0
C-4-13-II	23	1	5	4±0,89
C-4-13-III	35	1	8	3,18±2,48

According to Wuryanto (2004), length of stay (LOS) is the number of calendar days while still being treated until discharge from care. The average value of breast cancer hospitalization, the higher the severity, the higher, the length of patient care and many complications suffered by the patient so that it requires a longer treatment time. Standard Deviation (SD) is a reflection of the mean deviation of the data from the mean. If the SD value is greater than the mean value, the mean value is a poor representative of the entire data. And if the SD value is smaller than the mean value, the mean value can be used as a representative of the entire data.

Table 3. Classification of breast cancer drugs in the inpatient installation of RSUD Dr. Moewardi Surakarta for the period January-December 2017

Group	Medicine name	Total	%
Antibiotics	Epirubisin	25	20
	doxorubicin	13	10,4
Alkilasi	cyclophospamide	24	19,2
	cisplatin	8	6,4
Antimitotika	docetaxel	17	13,6
	Paclitaxel	13	10,4
Other cytostatic drugs	carboplatin transtuzumab	12	9,6
		3	2,4
Antimetabolit	fluorouracil	5	4
Alkaloid Vinca	Vinorelbin	5	4

Table 4. Distribution of the use of breast cancer drugs in the inpatient installation of Dr. Moewardi Surakarta for the period January-December 2017

Therapeutic regimens	Total	%
Single		
docetaxel	2	2,78
paclitaxel	1	1,39
vinorelbin	1	1,39
Combination		
cyclophosphamide,	17	23,6
epirubisin	7	9,72
epirubicin, docetaxel	5	6,94
carboplatin, docetaxel	5	6,94
cisplatin, paclitaxel	4	5,55
cyclophosphamide,	4	5,55
doxorubicin	4	5,55
carboplatin, paclitaxel	3	4,17
docetaxel, doxorubicin	3	4,17
cisplatin, docetaxel	2	2,78
epirubicin, paclitaxel	1	1,39

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doxorubicin, fluorouracil	1	1,39
carboplatin, trastuzumab	1	1,39
carboplatin, vinorelbin	1	1,39
epirubicin, vinorelbin	1	1,39
epirubicin, vinorelbin	1	1,39
docetaxel, vinorelbin	1	1,39
docetaxel, trantuzumab	1	1,39
paclitaxel, trastuzumab vinorelbin, trastuzumab	2	2,78
cyclophosphamide, doxorubicin, fluorouracil	1	1,39
carboplatin, docetaxel, trastuzumab	1	1,39
cyclophosphamide, epirubicin, fluorouracil	1	1,39
Total	**72**	**100**

The use of breast cancer drugs used a single therapy regimen (epirubicin 20%) and a combination (cyclophosphamide, epirubicin 23.61%). Many single therapies use epirubicin because epirubicin is a class of anthracycline antibiotics which has been shown to be effective in treating breast cancer and has the advantage of being the side effects of nausea and vomiting which is less severe than doxorubicin. Chemotherapy drugs are more effective when combined with the use of more than 1 drug because they can increase the ability to kill cancer cells. Various cytostatic drugs are administered with the aim of producing treatment results and reducing drug side effects compared to the use of single large doses of cytostatic drugs. The chemotherapy combination that is often used is EC (epirubicin, cyclophosphamide). EC is given in 4 cycles (12-16 weeks).

The components of inpatient care for breast cancer chemotherapy patients include accommodation costs, medical support costs, doctor's examination fees, drug costs and medical materials. Accommodation costs are fees paid by patients during inpatient care which include room packages and room fees and are influenced by LOS, comorbidities and complications. At the third severity level it ranks the highest (18.40%) this is because it has a LOS of 8 days and secondary diagnosis> 1. Medical support costs include the cost of infusion, injection, radiology, clinical laboratory. The amount of medical support costs is due to the type and number of secondary diagnoses and procedures. And found at the II severity level. The lowest cost of medical support is because there is 1 secondary diagnosis and it does not have a procedure of 99.04 and 1 day LOS. The doctor's examination fee is the cost of services received by a patient, which includes a doctor's visit, a doctor's consul. The highest doctor examination costs are at severity level I, this is because they have LOS for 5 days and the number of secondary diagnoses is more than severity II and III. The cost of drugs and medical materials is the cost used by patients to buy medicines and materials. medical besides chemotherapy. The high and low are influenced by differences in complaints and the number of procedures / actions taken. In this study it was found that at the III severity level had the highest cost of drugs and medical materials (52.10%), because the higher the severity level, the more drugs were used so that the drug costs were also higher

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Table 5. Components of costs for patients with the code INA-CBG's C-4-13-I / II / III who are hospitalized at Dr. Moewardi Surakarta period January - December 2017

Cost component	n	Cost (Rp)	Average Cost ±SD (Rp)	Min (Rp)	Max (Rp)	(%)
Severity I						
Accommodation	55	1.430.000	26.000±0	26.000	26.000	2,97
Medical support	55	26.239.000	477.073±1.054.068	34.500	7.895.000	54,52
Doctor's Examination	55	2.420.000	44.000±0	44.000	44.000	5,03
Drugs and Medical Materials	55	18.034.922	327.908±579.711	89.745	3.438.056	37,48
Real total cost (no chemotherapy)		48.123.922	1.061.995±604.451	1.197.504	14.549.166	100
Chemotherapy		183.188.440	3.330.699±3.317.996			
Total real costs		231.312.362	4.205.679±3.622.494			
Severity II						
Accommodation	6	1.104.000	184.000±41.144	138.000	230.000	7,42
Medical support	6	9.039.875	1.506.646±1.577.950	628.750	4.707.875	60,69
Doctor's Examination	6	399.000	66.500±7.530	62.000	80.000	2,67
Drugs and Medical Materials	6	4.352.237	725.373±830.029	129.297	2.389.159	29,22
Real total cost (no chemotherapy)		14.895.112	2.482.519±1.678.530	1.483.396	3.471.626	
Chemotherapy		13.667.592	2.277.932±770.725			
Total real costs		28.562.704	4.760.451±1.757.807			
Severity III						
Accommodation	11	2.150.000	195.455±137.841	66.000	462.000	18,40
Medical support	11	3.240.400	294.582±277.284	65.000	852.300	27,74
Doctor's Examination	11	205.500	18.682±15.080	10.160	50.000	1,76
Drugs and Medical Materials	11	6.086.044	553.277±311.869	125.000	910.500	52,10
Real total cost (no chemotherapy)		11.681.944	874.980±1.213.803	768.295	1.716.992	100
Chemotherapy		10.447.286	949.753±268.745			
Total real costs		22.129.230	2.011.748±769.772			

Based on table 6 which describes the difference in real costs in 2017 at RSUD Dr. Moewardi Surakarta with the INA-CBG rate for inpatients of JKN for breast cancer for the period January-December 2017. The amount of the difference in costs was obtained from the reduction in the total INA-CBG rate with the total real cost of JKN breast cancer patients with a positive difference of Rp. 8,015,104. which means that the real costs are lower than INA-CBG's rates. The largest difference is in the III severity level, because at this severity level there are more episodes. At the level of severity I there is a negative difference because the cost of INA-CBG claims is smaller so that it is not sufficient to meet the real rate. This is in line with Musyarofah's (2015) research at RSUD Dr. Moewardi Surakarta and Harianto's research (2013) at Dr. Sardjito Yogyakarta.

Based on the one sample test analysis at severity levels I, II and III, the results obtained are <0.05, this indicates that the real average cost of breast cancer treatment with all severity levels is significantly different based on the 2016 INA-CBG's rates. Severity levels I, II and III have a fairly high cost range value, this is due to the high costs of medical support, doctor's examinations, drugs and medical materials, chemotherapy and accommodation which are quite high so that the minimum and maximum cost ranges at all severity levels are very different. So a clinical pathway is needed that contains patient handling steps and consists of therapy protocols and patient service standards from hospital admission to hospital discharge in order to reduce cost swelling so that the real cost does not exceed the INA-CBG's package costs.

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Table 6. Comparison between the total real cost of RSUD Dr. Moewardi Surakarta with total INA-CBG package rates for the period January-December 2017

Severity	Cost	Average (Rp)±SD	Min (Rp)	Mak (Rp)	*P*
I	Real Costs	4.205.679±3.317.996	1.715.445	15.021.246	-
	Package Fee	3.075.000			0,000
II	Real Costs	4.760.451±770.725	3.022.398	7.823.785	-
	Package Fee	5.787.100			0,001
III	Real Costs	2.011.748±268.745	1.500.777	5.951.292	-
	Package Fee	7.833.800			0,000

Table 7. Results of multivariate correlation analysis of factors affecting real costs in patients with the INA-CBG code C-4-13-I / II / III who were hospitalized at Dr. Moewardi Surakarta

Factor	**Therapy costs**		
	N	***P***	**R**
Age	72	0,507	-0,079
Severity	72	0,242	0,140
LOS	72	0,007	0,031

Correlation statistical analysis is a statistical method used to analyze several variables towards total costs. Multivariate correlation analysis was performed by comparing age, LOS, to real costs without chemotherapy. Table 7 shows the results of the multivariate correlation to determine the factors that significantly affect the real cost without chemotherapy.

The results in table 7 show that the results of the correlation test where the factors of age (p = 0.507), severity (p = 0.242) and LOS (p = 0.07) have a value of p> 0.05, which means that the results of the age factor analysis, the severity level and LOS had no significant effect on the real cost of breast cancer therapy during the January-December 2017 period at RSUD DR. Moewardi Surakarta. This is because the main cost components for breast cancer patients are drug and chemotherapy costs, age, severity and LOS do not affect the real cost of breast cancer.

The components of drug and chemotherapy costs in breast cancer patients are quite large from the total real costs used in breast cancer patients. This is what causes that external factors such as age, treatment class, LOS do not contribute significantly to the high real cost of breast cancer patients.

CONCLUSION

Chemotherapy regimens in breast cancer patients in inpatient Dr. Moewardi for the period January-December 2017 is a single drug (epirubicin 20%) combination (cyclophosphamide and epirubicin 23.60%). The cost of chemotherapy at the C-4-13-I severity level is Rp. 183,188,440, C-4-13-II is Rp. 13,667,592, C-4-13-III in the amount of Rp. 10,447,286. There is a difference in the real cost of inpatient breast cancer treatment against the INA-CBG rate of Rp. 8,015,104 for 72 patients based on all levels of severity and the factors that influence it are LOS (length of stay) (p = 0.007).

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