PHASE OF CHEMOTHERAPY WITH NUTRITIONAL STATUS OF CHILDREN WITH LEUKEMIA AT ROOM BONA 2 DR. SOETOMO HOSPITAL

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Abstract
Chemotherapy is a medical therapy using anti-cancer drugs to kill cancer cells systemically, which have contributed to the occurrence of malnutrition for various reasons. Objective: identify Chemotherapy phase relationship with the nutritional status of children with Leukemia. This type of research: analytic correlational. The study population: all children with leukemia who undergo chemotherapy in the room Bona 2 Dr. Soetomo Hospital as many as 20 children used as a sample. Dependent Variables: The nutritional status of children with Leukemia. Independent Variables: Phase of Chemotherapy. The research instrument is: Bathscale, observation sheets, the curve Z-score at WHO-NCHS. Data were analyzed using Chi Square. Children with Leukemia who undergo chemotherapy are most numerous in the Consolidated phase as much as 35%. Nutritional status of children with Leukemia after undergoing Chemotherapy most (35%) experienced less nutritional status and poor nutrition status as much as 30%. Phase of Chemotherapy have a relationship with Nutritional Status of children with Leukemia who undergo chemotherapy ($p = 0.045 < 0.05$). Phase of Induction, half of children have poor nutritional status. Phase of Consolidation vast majority of children (57.1%) are in poor nutritional status. Phase of Maintenance whole of children has less nutritional status. Advised to healthcare workers in the Hospital should further promote the health education in order to improve the knowledge of parents, especially knowledge about providing good nutrition, so the nutritional intake of children is maintained although have nausea, vomiting when undergoing chemotherapy and child nutritional status not decline even nutritional intake is expected to improved.

Keywords : Phase of Chemotherapy, Nutritional Status, Leukemia

INTRODUCTION

Chemotherapy is a medical therapy using anti-cancer drugs to kill cancer cells systemically (related to the work systems of the body (Soetandyo, 2007). Chemotherapy has contributed to the occurrence of malnutrition for various reasons include nausea, vomiting, stomatitis or mouth sores, tract disorders digestion and decreased appetite. Approximately 70-80% of patients receiving chemotherapy will experience nausea and vomiting (Djauzi, 2005). A person that nausea and vomiting will lose appetite, so the nutritional intake disturbed. patients with impaired nutrient intake will experience weight loss body and have a negative impact on the ability to tolerate cancer treatment and is associated with decreased survival and quality of life (Perwitasari, 2009)

A good nutritional status can reduce complications of anti-cancer therapies and make the patient feel better. Nutritional support is an important part in supporting the treatment of cancer patients (Hariani, 2005).

According Permono (2001), approximately one-third of cancer in children is leukemia and is a cancer that is most common in children under the age of 15 years.

Director of Communicable Disease Control (PPTM) Ekowati Rahajeng (2012) revealed that blood cancer or leukemia is a type of cancer most commonly found in children with a prevalence of 2.8 per 100,000, followed by eye cancer (retinoblastoma) of 2.4 per 100,000 and cancer bone 0.9 per 100,000.

Leukemia patients in Indonesia in number 5-30% of malignancy that strikes children. The average incidence 4-4.5 cases per 100,000 children. At the Installation IRNA Children's Dr. Soetomo Hospital, the period from June to August 2014 there were 229 patients with leukemia treated in the children's room Bona 2 (IRNA Children's Medical Record, 2014). Average in 1 month there are 30 children undergoing chemotherapy treatment. From observations made, data obtained there were 24 children (80%) experienced a decrease in the intake of nutrients, caused by nausea and vomiting as many as 10 children (41%), anorexia 10 children (41%), stomatitis 4 children (18%) , Based on the initial survey in room Bona 2 Dr. Soetomo Hospital of 30 children who underwent chemotherapy there were 18 children who postponed chemotherapy because was reduced nutritional intake and nutritional status decreased.

Chemotherapy drugs attack not only cancer cells alone but normal blood cells produced in the bone marrow were also attacked. As a result, the patient can be very prone to infection, bleeding or general health problems (Tehuteru, 2005).

Treatment protocol in Dr Sardjito using Indonesia Protocol ALL-Standard Risk (2006) are:1) Phase Induction. Specific treatment begins with phase induction. This phase was given prednisone, vincristine, metotrexate, 6-mercaptopurine, LAsparaginase, and Daunorubicine. For standard risk given: prednisone at a dose of 60/40 mg / m^2, for high risk given: Dexametasone at a dose of 6 mg / m^2, orally at week zero until 6^{th} weeks. Vincristine is given in a dose of 1.5 mg / m^2 intravenously. Given in the first week to sixth weeks. Metotrexate administered intrathecal doses depending on the age at 0, 2^{nd}, and 4^{th} weeks. L-asparagine is given six times in a dose of 6000 U / m^2 intravenously at 4^{th} weeks and 5^{th} weeks. Daunorubicine given intravenously at 1^{st} week until 4^{th} weeks with dose of 30 mg / m^2. 2) Phase Consolidation. This phase consists of a 6-Merkaptopurine and Metotrexate. 6-Merkaptopurine administered orally at a dose of 50 mg / m^2 at 8^{th} week to 12^{th} week. Metotrexate administered intrathecal doses depending on age at 8^{th}, 10^{th}, and 12^{th} weeks. Metotrexate high doses (at a dose of 1000 mg / m^2) was administered with leucovorin rescue, given at 8^{th}, 10^{th}, and 12^{th} weeks. 3) Phase Re-Induction. This stage is only given to high-risk patients comprising Metotrexate administered intrathecal doses depending on age and given at 15^{th} weeks and 17^{th} weeks. Vincristine is given in a dose of 1.5 mg / m^2 intravenously, administered at 14^{th} weeks to 17^{th} weeks. Dexametasone administered orally at a dose of 6 mg

/ m² in 14th weeks to 17th weeks. Daunorubicine given intravenously in a dose of 75 mg / m² administered intravenously four times at 15th weeks and four times at 17th weeks. Lasparaginase given intravenously four times at 15th weeks and 17th weeks . 4) Phase Maintenance. Treatment at this stage with 6-Merkaptopurine and Metotrexate. Dexametasone administered orally at a dose of 6 mg/m² over the weeks that are not given 6-Merkaptopurine and Metotrexate along with Vincristine, given in a dose of 1.5 mg / m² intravenously.

According to Indonesia Protocol ALL - Standart Risk 2006, remission was maintained with intermittent chemotherapy cycle for 2 years. With modern aggressive therapy, 70% of children will be free of disease for 5 years after diagnosis. Relapse is also uncommon after 5 years. (Velde et al, 1999)

If by any reason to stop treatment midway, then the children who have entered the maintenance phase / maintenance can enter the stadium recurrence / relapse, so treatment starts from the beginning again (Netty, 1996).

Treatment can be more successful and efficient if the patient in a state of good nutritional status. Chemotherapy also can not be given if the child is not good general condition, including any nutritional disorder (Hariani, 2008). With the expected good nutrition will improve the child's condition and may undergo chemotherapy appropriately.

AIM

The research objective was to identified of the nutritional status of children with Leukemia who undergo chemotherapy in the room Bona 2 Dr. Soetomo Hospital. Special Purpose Research: (1) identify the phase of chemotherapy in children with Leukemia, (2) identify the nutritional status of children with Leukemia, (3) identify Chemotherapy phase relationship with the nutritional status of children with leukemia who undergo chemotherapy in the room Bona 2 Dr. Soetomo Hospital.

METHODS AND MATERIALS RESEARCH

The research method with a correlation Analyttic approach. Dependent Variables: The nutritional status of children with Leukemia who undergo chemotherapy. Independent Variables: Phase of Chemotherapy. Phase of Chemotherapy is divided into four phases: Phase Induction: 4x/ week, Phase Consolidation: 3x/ week, Phase Re Induction: 2x/ week, Phase Maintenance: 1x/ week. The research instrument: Bathscale, observation sheets, a Z-score at WHO-NCHS books. Z-score is used to measure the nutritional status of children with leukemia who undergo chemotherapy, which are grouped into four categories: (1). Good Nutrition:> +2 SD, (2). Enough Nutrition: ≥ -2 SD to +2 SD, (3) Less Nutrition: <-2 SD to ≥ -3 SD, (4). Poor Nutrition: <-3 SD. Data collector: questionnaire and observation sheets. Analysis of the data using: Chi Square.

Cross sectional study design because it made one observation (point time approach) to determine the relationship between variables. The study population of all children with leukemia who undergo chemotherapy in Room Bona 2 Dr. Soetomo Hospital. The amount of sample: total sample (20 Children).

Methods of data analysis to determine the relationship of the dependent and independent variables in the form of a cross tabulation (crosstab) using SPSS statistical test Chi-square. The statistical test used Chi Square (Fisher exact Test). with a limit of significance (P value) <α (0.05).

RESULTS

Characteristics of Children with Leukemia who undergo Chemotherapy

Table 1 shows the age of children with leukemia who undergo chemotherapy largest at the age of 1-5 years: 12 children (60%) and 8 children (40%) aged < 1 year. For the female sex were 11 children (55%) and male as much as 9 children (45%).

Duration of Suffering: 1-6 months as many as 12 people (60%) and only 2 children (10%) who suffered from leukemia for 1-2 years. Length of treatment is 1-6 months most 12 children (60%) and the least 1-2 years as many as 1 child (5%)

Table 1: Characteristics of Children with Leukemia who undergo Chemotherapy at Room Bona 2 Dr. Soetomo Hospital

Variable	f	%
Age (years) :		
< 1	8	40
1-5	12	60
Sex :		
Female	11	55
Male	9	45
Duration of Suffering :		
< 1 month	3	15
1-6 months	12	60
7 month -1 year	3	15
1-2 years	2	10
Length of treatment:		
< 1 month	3	15
1-6 months	12	60
7 month -1 year	4	20
1-2 years	1	5

Characteristics Mothers which has Children with Leukemia who undergo Chemotherapy

Table 2 shows the age of the parents (mothers) which has children with Leukemia who undergo Chemotherapy are: as many as six mothers (30%) were aged 26-30 years and 36- 40 years, and only 1 (5%) over the age of 40 year. Most job was as a housewife: 12 people (60%) of mothers; 5 private sector employees (25%) and laborers 3 people (15%). While studies of 8 people (40%) is junior school, and only 2 (10%) educated Academy/ College. She earns 12 people (60%): less than 1 million, and only 1 (3%) more than 2 million

Phase of Chemotherapy

Table 3 shows the children with Leukemia who undergo Chemotherapy at Room Bona 2 Dr. Soetomo Hospital many as 7 children (35%) in Consolidation Phase, and there are 6 children (30%) which is in Induction Phase, currently in Reinduction Phase there are 5 children (25%) and only 2 children (10%) who were Maintenance Phase

Nutritional Status of Children with Leukemia while undergoing chemotherapy

In Table 4 looks that the nutritional status of children before undergoing Chemotherapy are enough nutritional status as many as 9 children (45%), 8 children (40%) good nutritional status , and only 3 children (15%) less nutritional status. After undergoing chemotherapy most of the children have less nutrition as much as 7 children (35%), poor nutrition as much as 6 children (30%), and only two children (10%) have a good nutritional status.

Table 2: Characteristics Mothers which has Children with Leukemia who undergo Chemotherapy at Room Bona 2 Dr. Soetomo Hospital

Variable	f	%
Age (years) :		
21 – 25	2	10
26 – 30	6	30
31 -35	5	25
36 – 40	6	30
>40	1	5
Job :		
Housewife	12	60
Labor	3	15
Private employees	5	25
Level of Education:		
Primary School	3	15
Junior High School	8	40
Senior High School	7	35
Academy/ College	2	10
Income (IDR):		
< 1.000.000	12	60
1.000.000-2.000.000	7	35
> 2.000.000	1	3

Table 3: Phase of Chemotherapy in Children with Leukemia at Room Bona 2 Dr. Soetomo Hospital

Phase	f	%
Induction	6	30
Consolidation	7	35
Reinduction	5	25
Maintenance	2	10
Total	20	100

Table 4: The nutritional status of children with Leukemia while undergoing chemotherapy at Room Bona 2 Dr. Soetomo Hospital

Nutritional status	Before Chemotheraphy		After Chemotheraphy	
	f	%	f	%
Good	8	40	2	10
Enough	9	45	5	25
Less	3	15	7	35
Poor	-	-	6	30
Total	20	100	20	100

Chemotherapy phase relationship with the Nutritional Status of Children with Leukemia

The results showed an association between chemotherapy phase with the nutritional status of children with leukemia who undergo chemotherapy in Room Bona 2 Dr. Soetomo Hospital (p value = 0,045 < α = 0,05).

In Table 5 shows the children with leukemia who undergo chemotherapy in the induction phase of each have a 3 children (50%) on the status of enough nutrition and poor nutrition. In the Consolidation Phase more than half (57.1%) as many as 4 children in less nutritional status, two children (28.6%) on the status of enough nutrition and 1 child (14.3%) on the poor nutritional status. Being on Phase Reinduction each have two children (40%) a good nutritional status and poor and 1 child (20%) on the less nutritional status. In Phase Maintenance of all children (100%) were in less nutritional status

Table 5: The Nutritional Status of Children with Leukemia who undergo Chemotherapy based on Phase Chemotherapy at Room Bona 2 Dr. Soetomo Hospital

Phase	The Nutritional Status								Total	
	Good		Enough		Less		Poor			
	F	%	F	%	F	%	F	%	F	%
Induction	-	-	3	50	-	-	3	50	6	100
Consolidation	-	-	2	28,6	4	57,1	1	14,3	7	100
Reinduction	2	40	-	-	1	20	2	40	5	100
Maintenance	-	-	-	-	2	100	-	-	2	100

Chi Square Test : p value = 0,045 < α = 0,05

DISCUSSION

In children who are less nutritious when undergoing chemotherapy due to various factors, including factors that lower parental education, where research data shows 40% of parents of junior high school education. According Notoatmodjo (1997) educational influence on the formation of a person's attitude. The higher the education level, the higher a family of analytical and information absorption. This can be seen in two well-nourished children because the parents are college educated, have a wider horizon, know how the handling and care of children who experience nausea and vomiting that child nutrition is maintained with less good or sufficient.

Poor nutritional status and less can also be viewed in terms of income where the income of the elderly patients with Leukemia who received chemotherapy as many as 12 people (60%) is less than 1 million, and only 1 (3%) income of more than 2 million., Thus parents difficulty in managing money to provide nutritious food and liked children, let alone the cost of treatment is not small, despite being aided by funding from the government. Minimal income also affects the purchasing power. Less than 1 million of course difficult for families to meet the

nutritional needs of children, not to mention meeting the needs of others. It needs to be given to Health Education in Hospitals indirectly, for example by putting up posters with striking colors and words that attract attention or appeal that there is inexpensive food and have a high in nutrients for patients with Leukemia. It is expected the family to understand that nutritious food does not always have to be expensive.

In terms of the age of the parents, also affects the nutritional status of children with Leukemia who undergo Chemotherapy, where there are 13 people (65%) aged productive, so busy with household affairs, it is possible not only to think of their sick children, but also his another.

Judging from the work there are 12 people (60%) of mothers who do not work (housewife) who mostly live in the house, rarely meet others so that the exchange of information and experiences with others to be minimal.

The opposite is also obtained two children (10%) good nutritional status and 5 children (25%) enough nutritional status, it is contrary to the opinion of Hariani (2005) that Chemotherapy resulted in a nutritional deficiency due to increased anorexia, stomatitis, changes in taste and gastrointestinal disorders. There is two children have a good nutritional status and 5 children are enough nutritional status able to tolerate the Chemotherapy treatment obtained up to four times in one week, children are able to cope with nausea vomiting. Nausea and vomiting can be overcome by distraction or relaxation, such as watching television, playing or reading a book.

To reduce nausea child can drink anti-emetic drugs such as sofran, ondancetron or antacids, and given a cold fruit juice so that children do not feel nausea and vomiting. For example guava, papaya and citrus mixture or a mixture of star fruit and carrots. With no feeling of nausea and vomiting nutritional status of children remain in good condition. If there is any injury in the mucosa of the mouth, then the food can be given via the naso gastric tube with normal platelet requisite laboratory results, for mounting a naso gastric tube will cause bleeding when a low platelet count.

Induction phase is given for 6 weeks, entered the drug once every 1 week. Consolidation phase given in week 7 to week 10, treatment 1 week, Phase Reinduksi administered at week 11 to week 15, 1 week 1 time treatment. While Phase Maintenance / Maintenance at week 16 to week 63, by which time the first 4 weeks of treatment at all. In Phase Induction and Consolidation Phase hospitalized patients, whereas in Phase Reinduksi and Phase Maintenance performed on an outpatient basis.

According Ratwita (2007) Consolidation phase is the phase after induction phase, in which drugs are given is cytarabine, methotrexate, Leunase, cyclophosphamide, which is a drug that affects sitostatika nausea and vomiting being. The entry of the three kinds of chemotherapy drugs within a period of one week can make a patient very nausea and vomiting with due to does can not eat. Because they do not want to eat caused the weight down and get into a lower nutritional status.

The existence of poorly nourished children in Phase Reinduksi because in this phase the child can undergo treatment on an outpatient basis, do not need hospitalization. According Ratwita (2007) and Phase Maintenance Phase Reinduksi, child care Leukemia is done on an outpatient basis. This resulted in the fulfillment of the nutrients depend on parents at home. Low level of education or less good knowledge of parents about nutrition causing less nutritional intake even unfulfilled.

In order to keep good nutritional status of children, parents are expected to understand the importance of food to increase the body's immunity, so that children are able survive of the disease and the side effects of chemotherapy. Parents are also expected to continue to seek knowledge and add insight about the kind

of food that is nutritionally balanced with a relatively cheap price, so that the intake of adequate and nutritious, Chemotherapy phases completely finished, the child finally being cured.

CONCLUSIONS AND SUGGESTIONS

From the results of the study in children with leukemia who undergo chemotherapy in the Room Bona 2 Dr. Soetomo Hospital show that:

1. Children with Leukemia mostly underwent chemotherapy in the Room Bona 2 Dr. Soetomo Hospital in the Consolidation Phase, and only a small proportion in Phase Maintenance.
2. Children with Leukemia mostly experienced less and poor nutritional status.
3. There is a relationship between the phase of chemotherapy with Nutritional Status of children with Leukemia ($p = 0.045 < 0.05$). In Phase of Induction, half of children have poor nutritional status. Phase of Consolidation vast majority of children (57.1%) are in poor nutritional status. Meanwhile in the Phase of Maintenance whole of children has less nutritional status.

Advised to health care workers in hospitals should further promote health education in order to improve the knowledge of parents, especially knowledge about providing good nutrition, so the nutritional intake of children is maintained although
have nausea vomiting when undergoing chemotherapy and child nutritional status does not degrade even nutritional intake is expected to be improved.

Also expected in conveying health education should be adjust to condition of the families which is undergoing a state of anxious and strained, then you should health education be given in condition relaxed to make it more easily accepted, more attention to quality delivery of good information, in terms of content, language used, props and means used primarily in providing information about nutrition for children with Leukemia.

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