



Pain, Nausea and Vomiting as an Early Detection of Children with Leukemia Cancer

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Abstract

Background: Cancer is a malignant disease that often causes death. Not only does it attack adults, cancer can also attack children. The death rate reaches more than 50%. The high death rate in children due to cancer can be caused by parents' ignorance of the symptoms of cancer itself. There are 300,000 children diagnosed with cancer every year between the ages of 0-19 years.

Purpose: factors associated with early detection of childhood leukemia cancer at the Cahaya Community Foundation, Padang City in 2024

Methods: The design of this research is to use a Descriptive study. In this study there were 159 patient populations at the Cahaya Community Foundation in Padang City.

Results: The results showed that children experienced symptoms of pain, nausea, vomiting. Parents said that while the child was experiencing nausea and vomiting, he had never received or used pharmacological or non-pharmacological therapy before. Of those experiencing pain after leukemia cancer chemotherapy, 18 (45.0) had no pain, 20 (50.0) had mild pain, and 2 (5.0) had moderate pain. leukemia cancer, experienced nausea and vomiting after chemotherapy for leukemia cancer as much as vomiting occurred 1-2x 1 (2.5), vomiting occurred 3-4x 5 (12.5), vomiting occurred 5-6x 19 (47.5), and vomiting occurred 7x more than 15 (37.5) respondents.

Conclusion: that children with cancer experience symptoms of pain and nausea, vomiting

Keywords:

Cancer, children, pain, nausea and vomiting

Introduction

Leukemic cancer is a hematological malignancy that is often found in children, accounting for 25-30% of all malignancies in children aged 0-14. ALL is a primary malignancy in the bone marrow in children with a percentage of 35% of childhood

cancers, 80% being ALL and 20% acute myeloblastic leukemia (AML). In Indonesia there are currently 80,000,000 children under the age of 15 years, some of whom are diagnosed with 3,000 new cases of ALL every year (Nur Hijrah Tiala¹, Nurhannifah Rizky Tampubolon², M.Abu³, 2023)

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Leukemia cancer has the highest mortality rate, with the 10th most cases in men and 11th in women. Leukemia is a disease characterized by an increase in the number of white blood cells (leukocytes) which can be recognized by malignancy in the blood cell-making apparatus in the form of pathological proliferation of young hemopoetic cells which is characterized by failure of the bone marrow to form normal blood cells and infiltration into body tissue. other. This increase is very fast and uncontrollable as well as the abnormal shape of the white blood cells (Nur Hijrah Tiala¹, Nurhannifah Rizky Tampubolon², M.Abu³, 2023).

Globally, leukemia cancer in boys compared to girls is 4, 72 and 3.86 per 100,000 people each year, respectively. Boys have a 5%-48% higher risk of childhood cancer compared to girls. The prevalence rate of leukemia cancer that differs between genders is currently still unclear, it is suspected that this is due to biological factors and clinical prognosis. The gender differences experienced cannot be explained significantly (Fetriyah et al., 2024)

According to the World Health Organization, there are 175,300 new cases of leukemia in children and around 96,400 children have died of cancer worldwide. Because many patients are undergoing treatment at advanced stages. In Indonesia, there are currently around 80,000,000 children under the age of 1 year and it is estimated that there are around 3,000 cases of leukemia every year. According to 2018 Riskesdas data, in Indonesia there are 4100 children with cancer and leukemia is a type of cancer that is often found in children (Amari,

2023).

In Indonesia there are around 11,000 cases of childhood cancer every year, and leukemia is the highest cancer in children with 2.8 per 100,000 population. Acute Lymphoblastic Leukemia (ALL) is a hematological malignancy that is often found in children, accounting for 25-30% of all malignancies in children aged 0-14 years. ALL is a primary malignancy in children's bone marrow with a percentage of 35% of childhood cancers, 80% of which are ALL and 20% of acute myeloblastic leukemia (AML). In Indonesia there are currently 80,000,000 children under the age of 15 years, some of whom are diagnosed with 3,000 new cases of ALL every year (L. N. Aini et al., 2022)

Based on the prevalence in West Sumatra, leukemia cancer is 2.4%, which is the second highest incidence after Yogyakarta province, which is 4.9%. Based on medical record data at the M Djamil Padang Hospital, it shows an increase in leukemia cases in children every year. In 2016 there were 51 children affected by leukemia. Then in 2017 there were 89 new cases and in 2018 there was an increase with 142 new cases (Rahmat et al., 2022)

The causes of leukemia in children are generally anemia, thrombocytopenia and leukopenia which is a failure of the hematopoiesis process. However, in children, around 40-50% of the clinical symptoms that appear are pain in the joints or arthralgia which is caused by infiltration of the periosteum, joint bones and expansion of the bone marrow cavity. Another symptom is back pain, which is caused by the presence of an intradural mass and must be alert to the possibility of spinal fractures.



Around 16% of childhood leukemia sufferers have vertebral fractures when diagnosed, 55% have back pain and 35% experience both. The prevalence of fatigue in pediatric patients with leukemia ranges from 59% -100% depending on the clinical status of the leukemia cancer (Rahmat et al., 2022). The most frequent prevalence was found in children with leukemia cancer, with children complaining of pain (82.6%), fatigue 59%, nausea (69.6%), vomiting (58.7%), disturbed sleep patterns 62.9%, and appetite disorders 71.4% (Sardjito, 2020).

Methods

2.1 Research design

This research design is a mixed method with regard to the use of quantitative approach methods. This approach aims to obtain more comprehensive and objective data regarding factors related to early detection of childhood leukemia cancer at the Cahaya Kota Padang Community Foundation in 2024.

2.2 Setting and samples

The sampling method in this research was using purposive sampling technique. Technique *Purposive Sampling* according to is sampling using several regular considerations in accordance with the desired criteria to determine the number of samples to be studied. The sample in this study was children aged 3-8 years at the Komnitas Cahaya Foundation in Padang City with a total of 40 children with leukemia cancer.

The inclusion and exclusion criteria in this study are as follows: Children aged 3-8 years, Children who experience the effects of pain,

fatigue, nausea, vomiting, disturbed sleep patterns and eating disorders after chemotherapy, Children who are at the Cahaya Kota Community Foundation Padang while undergoing chemotherapy

2.3 Measurement and data collection;

In this study, a questionnaire was used to assess the distribution of complaints felt by children with leukemia at the Cahaya Kota Padang Community Foundation. Based on the patient's assessment as the person receiving the direct interview itself. In quantitative research consisting of a questionnaire that includes name/initials, gender and age. In the questionnaire on the distribution of complaints felt by children with leukemia cancer, 5 (five) measuring instruments were used for the patient's parents. This questionnaire uses a Likert scale measuring instrument.

2.4 Data analysis;

Univariate quantitative data analysis aims to explain or describe the characteristics of each research variable. The form of univariate analysis depends on the type of data. In general, this analysis only produces frequency distributions and percentages of each variable (Notoatmodjo, 2014). In quantitative data analysis, data was obtained on the frequency distribution of complaints felt by children with leukemia cancer

2.5 Ethical considerations.

In conducting research, researchers apply for permission from respondents to obtain research approval. After obtaining approval, the researcher conducted the research by enforcing ethical issues.

Results

Data that researchers obtained during the research period from June to July 2024 at the





Cahaya Community Foundation of Padang City with the characteristics of respondents consisting of age and gender

Frequency distribution of respondents who experienced pain after chemotherapy in children with leukemia cancer

After Chemotherapy	Frequency	%
No way	18	45.0
Mild pain	20	50.0
Moderate pain	2	5.0
Amount	40	100

From table 5.3 it can be seen that of the 40 leukemia cancer respondents, 18 (45.0) experienced pain after leukemia cancer chemotherapy without pain, 20 (50.0) had mild pain, and 2 (5.0) moderate pain.

Table 2

Frequency distribution of respondents who experienced nausea and vomiting after chemotherapy in children with leukemia cancer

After Chemotherapy	Frequency	%
Vomiting occurs 1-2x	1	2.5
Vomiting occurred 3-4x	5	12.5
Vomiting occurred 5-6x	19	47.5
Vomiting occurred more than 7 times	15	37.5
Amount	40	100

From table 2 it can be seen that of the 40 leukemia cancer respondents with leukemia cancer, nausea and vomiting occurred after chemotherapy for leukemia cancer, vomiting occurred 1-2x 1 (2.5), vomiting occurred 3-4x 5 (12.5), vomiting occurred 5-6x 19 (47.5), and



vomiting occurred 7x more than 15 (37.5) respondents.

Discussion

The results of research on the distribution of complaints felt by children regarding diagnosis showed that out of 40 respondents, 2 (5.0%) patients found the majority of pain.

According to research in children with leukemia cancer, bone pain is one of the clinical manifestations that usually occurs when the bone marrow becomes wider due to the accumulation of abnormal leukocytes. And research conducted by shows that more than 40% of children with leukemia will experience pain (Kurniawan & Pawestri, 2020). This research is also in line with research (Hayati and Wahyuni 2018) which states that attention diversion techniques using storytelling methods that are appropriate to the child's developmental stage will have a significant influence in the process of reducing physiological pain, stress and anxiety in diverting the child's attention from painful stimuli.

This research is in accordance with (Nunes et al., 2019) which found that children undergoing chemotherapy experienced pain (53.3%). Pain is associated with several conditions including those related to leukemia cancer, chemotherapy, diagnostic or monitoring procedures, and side effects of treatment. Children undergoing chemotherapy report significantly more body pain. And research conducted by Sapariah Anggraini and Dyah Trifi Aningsih found that the level of pain in children with leukemia experienced moderate pain (Health & No, 2017).

According to researchers' assumptions, children with leukemia after undergoing chemotherapy, some children experience pain, this condition occurs due to unpleasant sensations which can limit the child's capability and ability to carry out daily routines due to the chemotherapy being carried out. In the questionnaire in this study, which consisted of 15 questions, it was found that there were 5 highest answers, namely question 1, constantly crying, screaming, sobbing, growling, often complaining, 8% answered pain, the second was squirming, shifting back and forth, tense, hesitant. hesitate to move, maintain pressure on body parts as much as 8%, the 3rd has no particular expression or smile, eye contact as much as 8%, the 4th is difficult to persuade or make comfortable as much as 8%, the 5th requires confidence by occasionally touching, occasionally hugging, or talking, attention is easily shifted by 5%.

Then, the 5 lowest answers, namely question 1 calm, relaxed, no need to be comforted, 95% answered no pain, 2nd curved, stiff or jerking in a fixed position, shaking head movements from side to side, rubbing body parts 95%, 3rd none screams/groans (awake/fall asleep) as much as 90%, the 4th is uncomfortable, restless, tense, increased tone, rigid flexion/extension of the limbs intermittently by 90%, the 5th often frowns, constant, clenched jaw, trembling chin, deep wrinkles on the forehead, eyes closed, mouth open, deep lines around the nose/lips. The results of research on the distribution of complaints felt by children regarding diagnosis showed that of the 40 respondents, the majority were



nausea and vomiting in 15 (37.5%) patients. In research (Steinhorn, Din, & Johnson, 2017) nausea and vomiting occurred quite high, this may be due to the 2017 LMA protocol at RSUP dr. Sardjito uses daunorubicin and cytarabine, both drugs are medium risk drugs and cause emesis in 30%-90% of children (Moewardi, 2022.). And research conducted by Bansal, et al. (2023) shows that nausea and vomiting due to chemotherapy is a common and significant problem in children receiving chemotherapy (Bansal et al., 2023).

Based on research (Abdul Wahab Sjahranie 2018), nausea and vomiting in children with leukemia cancer often occurs because of the side effects of chemotherapy treatment which kills leukemia cancer cells, normal cells or newly growing (developing) cells. Nausea is an uncomfortable feeling in the esophagus and stomach that causes vomiting, while vomiting is triggered by afferent impulses to the vomiting center (which is located in the medulla) from *chemoreceptor trigger zone*, pharynx and digestive tract, and cerebral cortex caused by chemotherapy drugs. Treatment of nausea and vomiting with ondansetron which is given intravenously 30 minutes before chemotherapy (Fatikasari et al., 2018).

According to research children undergoing chemotherapy will experience something called nausea, vomiting, this incident affects 70%-80% of patients undergoing chemotherapy. Usually children who experience nausea and vomiting after chemotherapy in hospital will be treated with supportive therapy in the form of antiemetics (Sardjito, n.d.). And research conducted by

Celeste, et al (2022) shows that nausea and vomiting will occur in children undergoing chemotherapy (Ly et al., 2022).

According to researchers' assumptions, children with leukemia cancer after undergoing chemotherapy, some children experience nausea, vomiting, this condition occurs due to irritation of the stomach or gastrointestinal lining which results in the release of neurotransmitters, which then sends signals to the vomiting center in the brain, children will experience heartburn or nausea due to chemotherapy. which is conducted. In the questionnaire in this study, which consisted of 8 questions, the 5 highest answers were obtained, namely 1 in the last 12 hours, every time I vomited I vomited 90% of the time, the 2nd in the last 12 hours, from the vomiting I experienced, I felt uncomfortable 80%, the 3rd in the last 12 hours, I felt like vomiting but didn't spit anything out 78%, the 4th in the last 12 hours, I felt nauseous or had an uncomfortable feeling in my stomach 75%, the 5th in the last 12 hours, I felt nauseous or had stomach discomfort for 75%. And the 5 lowest answers are question 1 in the last 12 hours, from the feeling of wanting to vomit, I felt 3% discomfort, 2nd in the last 12 hours, from the vomiting I experienced, I felt 3% discomfort. 3%, the 3rd in the last 12 hours, every time I vomit, I vomit 3%, the 4th in the last 12 hours, I feel like vomiting but don't spit out anything 3%, the 5th in In the last 12 hours, I vomited 5% of the time.

Implication and limitations

As a consideration in making policies regarding non-pharmacological therapy





programs for children by knowing complaints so that they can intervene with complaints, pain, nausea and vomiting in children with leukemia cancer

Conclusion

Where complaints of pain felt by children regarding the diagnosis of leukemia cancer were 2 (5.0%) children. The distribution of complaints of nausea and vomiting felt by children regarding the diagnosis of leukemia cancer was 15 (37.5%) children.

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Author contribution

We encourage authors to provide statements outlining their individual contributions

Conflict of interest

No conflict of interest among authors.

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