

## The outcomes of induction treatments in childhood acute lymphoblastic leukemia at Children Hospital, Vientiane Capital, Lao PDR

Thatsadaphone Khounnorath<sup>1</sup>, Patcharee Komvilaisak<sup>2</sup>, Bounpalisone Souvanlasy<sup>3</sup>, Sourideth Sengchanh<sup>1</sup>

1. Faculty of Medicine, University of Health Sciences, Vientiane Capital, Laos.
2. Faculty of Medicine, Khon Kaen University, Thailand.
3. Hematology and Oncology Department, Children's hospital, Vientiane Capital, Lao PDR

Received 18 July 2022; received in revised form 20 November 2023; accepted for publication 25 November 2023

---

### Abstract

**Background:** Cancer is one of the leading causes of death in children. The incidence of cancer in children under the age of 15 year varies worldwide. Despite significant advances in the treatment and early detection, cancer is the second major cause of child mortality in developed world. In some developed countries such as Australia, Ireland, Switzerland and the United States, the incidence of childhood cancer has been estimated at 140 - 160 per 1 million children.

**Objectives:** To determine the outcomes of induction treatment in childhood acute lymphoblastic leukemia at Children Hospital, Vientiane Capital, Lao PDR.

**Methodology:** A prospective descriptive study at Hematology - Oncology department, Children hospital, in Vientiane Capital, Laos. From December 2021 to November 2022. The include criteria was the newly acute lymphoblastic leukemia who received chemotherapy treatment during induction phase. The descriptive statistic was analyzed with SPSS version 26 and reported by table, chart with frequency

**Results:** A total participants 36 newly acute lymphoblastic leukemia including the male was higher the female, the clinical profile showed fever and pale were most common, during the induction were including the complication of specific treatment and supportive treatment. Seven (19.4%) patients died due to infection the pathogen of hemoculture were *acetobacter*, *klebsiella pneumonia*, *pseudomonas aeruginosa* and *ESBL*, bleeding and tumor lysis syndrome during the course of induction therapy. After induction therapy twenty-two (61.1%) patients went into the complete remission (<5% blast cells in bone marrow), five patients (13.9%) was not in remission (>5% blast cells in the bone marrow). Seven (19.4%) patients died and 2 patients were refuse of treatment including the problem of financial and family.

**Conclusion:** The rate of complete remission of induction therapy and death during induction therapy of the outcome in acute lymphoblastic leukemia was high, the male of remission is higher than female and the most classification of risk group was high risk group. The feature of clinical acute lymphoblastic leukemia paediatric was fever and pallor. The majority cause of death is infection

**Copyright:** © 2023 Thatsadaphone *et al.* This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

---

**Keywords:** Acute lymphoblastic leukemia, Peripheral blood smear, Chemotherapy, Children Hospital

\* **Corresponding author:** Thatsadaphone Khounnorath, Tel: 020 7771 9779, Email: thatsadaphoneknr@gmail.com

## Introduction

Cancer is one of the leading causes of death in children. Particularly among children under the age of 15. Despite significant progress in treatment and early detection, it remains the second major contributor to child mortality in developed nations [14] [9]. Varied incidence rates are observed globally, with estimates in developed countries such as Australia, Ireland, Switzerland, and the United States ranging from 140 to 160 cases per 1 million children [2] [10]. Leukaemia emerges as the most prevalent childhood malignancy, accounting for 27% to 35% of childhood cancers in different regions [10] [3].

The mortality rates of leukemia, especially acute lymphoblastic leukemia (ALL), have seen a decline in Europe, the United States, and Japan due to therapeutic advancements [9]. Despite the low incidence of acute leukemia, its high mortality deems it of crucial importance [7]. Acute lymphoblastic leukemia comprises approximately 30% of all childhood malignancies, with survival rates exceeding 85% and five-year event-free survival rates surpassing 93% for low-risk groups [12]. Disparities exist globally, as seen in Thailand with survival rates ranging from 51% to 59% between 1995 and 2009 [4].

In Chiang Mai, Thailand, the five-year overall survival rate for children was 59.04%, varying in high-risk and standard-risk groups. The overall incidence of childhood cancer, including acute lymphoblastic leukemia (ALL), has been gradually increasing since 1975, with childhood cancer mortality decreasing by more than 50% between 1975 and 2010. The 5-year survival rate for ALL has notably increased from 60% to around 90% for children under 15 years and from 28% to over 75% for adolescents aged 15-19 years [4].

Acute lymphoblastic leukemia remains the most common cancer diagnosed in children, representing approximately 25% of cancer diagnoses among those under 15 years. Geographic and ethnic variations in childhood ALL incidence exist, attributed partly to ancestry-related genetic differences. While comprehensive data on ALL in North America and Europe are available, most Asian countries lack sufficient information due to the absence of registries and diagnostic methods [4]. Initiatives like the Thai POG national protocol in 2006 have aimed to standardize treatment, impacting survival rates positively [4]. In Laos, the Childhood Cancer project has identified 35 cases since 2012, emphasizing the need for ongoing research and treatment efforts. Therefore, the aims of this study are to determine the outcomes of induction treatment in childhood acute lymphoblastic leukemia at Children Hospital, Vientiane Capital, Lao PDR

## Material and Methods

### Study design

A prospective descriptive study was conducted at the Hematology-Oncology department of Children's Hospital in Vientiane Capital, Laos.

### Study site

The Hematology-Oncology department at National Children's Hospital in Vientiane, Lao PDR, served as the study site. This facility boasts 100 beds and 13 wards, with the outpatient ward typically attending to 200 cases per day.

### Study period

The study spanned from December 1<sup>st</sup>, 2021, to November 31<sup>th</sup>, 2022, covering a 12-month period.

### Sample population

The study focused on all newly diagnosed Acute Lymphoblastic Leukemia (ALL) patients aged 1-15 years undergoing the induction phase of chemotherapy as per the National protocol for treatment of childhood cancers by the Thai Pediatric.

### Inclusion criteria

All children newly diagnosed with Acute Lymphoblastic Leukemia, aged 1-15 years, undergoing chemotherapy treatment during the induction phase.

### Exclusion criteria

Children with a history of relapsed ALL, those not providing consent for participation, aged less than 1 year, and receiving chemotherapy treatment outside the induction phase.

### Data collection

Data collection occurred over the 12-month period, involving newly diagnosed ALL patients (Figure 1). Diagnosis was based on physical examination, medical history, and complete blood count. Physical examination included assessing vital signs, lymphadenopathy, hepatosplenomegaly, anemia, bleeding, and bone pain. Complete blood counts identified bicytopenia or pancytopenia, with blasts observed in peripheral blood smears. Patient consent was obtained for bone marrow aspiration, performed by qualified medical professionals using the Kilma-Rosegger marrow needle. The criteria for a positive bone marrow aspiration diagnosis were the presence of over 25% lymphoblasts, as determined by hematologists.

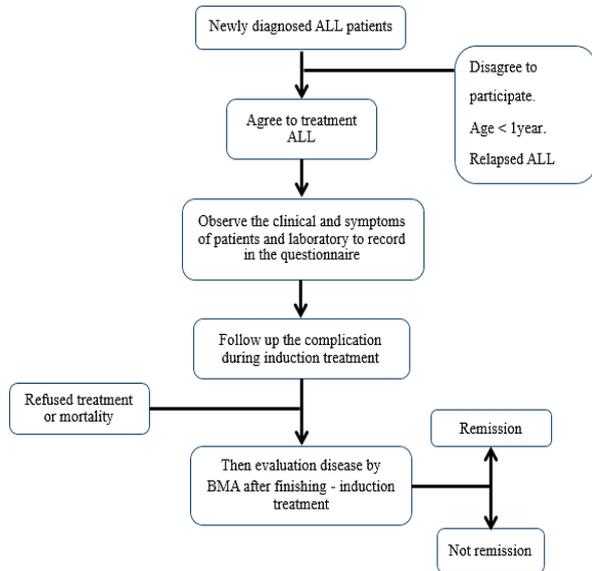
### Data management and Analysis

Following data collection, a comprehensive review was conducted. The data were coded and stored in a computerized database. The statistical analysis was performed using SPSS software, employing measures such as frequency, mean, and percentage.

**Ethics clearance**

This study received approval from the Committee of Ethical Research at the University of Health Sciences (Approval No.274/REC). All ethical guidelines and regulations were strictly adhered to throughout the research process.

Figure 1: Flow chart: data collection



**Results**

**Social-demographic**

The prospective study involving 36 newly acute lymphoblastic leukemia including participant ages were distributed as follows: 5.6 % (n= 2) were 1 year of age, 86.1% (n= 31) were between 2 and 10 years of age and 8.3% (n= 3) were more than 10 years of age. The minimum of age was 1 year and 12 years was the maximum, the mean of age 4.72. Gender distribution revealed that 77.8 % (n=28) of participants were male, while 22.2% (n=8) were female. The mean of age 4.72 (Table 1).

Table 1: The social-demography

Variables	Frequency (n=36)	Percentage (%)
<b>Age</b>		
1 year	2	5.6
2 and 10 years	31	86.1
More than 10 years	3	8.3
<b>Gender</b>		
Male	28	77.8
Female	8	22.2

**The clinical profile**

The clinical profile at diagnosis consists of the chief complaint 55.4% (n=31) were fever, 16.1% (n=9) were fatigue, 2.8% (n=1) were cough, 17.9% (n=10) were bone pain and 8.9% (n=5) were abdomen pain. The clinically presented 28.6% (n=34) were pale, 20.2% (n=24) were lymphadenopathy, 21% (n=25) were

hepatomegaly, 15.1% (n=18) were splenomegaly, 2.5% (n=3) were edema, 12.6% (n=15) were bleeding. The laboratory at diagnosis was included WBC< 10.000 was 36.1% (n=13), WBC 10.000-50.000 were 22.2% (n=8), 50.000-100.000 were 36.1% (n=13) and WBC >100.000 was 5.6% (n=2), the haemoglobin separated in 3 parts: <7g/dl was 30.6% (n=11), 41.7% (n=15) were Hb 7.1-8.9 g/dl and 27.8% (n=10) were Hb >9g/dl. About the platelet count was <20.000 were 19.4% (n=7), 20.000-90.000 were 41.7% (n=15) and 38.9% (n=14) was the platelet count >100.000. The found the blast cell in the peripheral blood smear was 91.7% (n=33) and we were seen the lymphoblast >25% in bone marrow was 100% (n=36). There were 6 patients for flow cytometry consist of 66.7% (n=4) were B-cell ALL and 33.3% (n=2) were T-cell ALL (Table 2).

Table 2: The clinical profile

Variables	Frequency (n=36)	Percentage (%)
<b>Chief complaint</b>		
Fever	31	55.4
Fatigue	9	16.1
Cough	1	2.8
Bone pain	10	17.9
Abdomen pain	5	8.9
<b>Physical exam</b>		
Pale	34	28.6
Lymphadenopathy	24	20.2
Hepatomegaly	25	21
Splenomegaly	18	15.1
Edema	3	2.5
Bleeding	15	12.6
<b>WBC count at diagnosis</b>		
WBC < 10.000	13	36.1
10.000 – 50.000	8	22.2
50.000-100.000	13	36.1
>100.000	2	5.6
<b>Hemoglobin at diagnosis</b>		
< 7 g/dl	11	30.6
7.1-8.9 g/dl	15	41.7
>9 g/dl	10	27.8
<b>Platelet count at diagnosis</b>		
PLT < 20.000	7	19.4
20.000- 90.000	15	41.7
>100.000	14	38.9
<b>Seen blast in</b>		
PBS	33	91.7
BMA	36	100
<b>Flow cytometry (n=6)</b>		
B cell ALL	4	66.7
T cell ALL	2	33.3

**The risk of evaluation**

The patients were classified into different risk group according Thai POG 2019 protocol, the high-risk group was the most frequent 55.6% (n=20), follow by the standard risk was 38.9% (n=14) and the lastly very high risk had 5.6 % (n=2) as shown in (Table. 3).

Table 3: The risk group of evaluation

Variables	Frequency	Percentage
Risk group of ALL		
Standard risk	14	38.9
High risk	20	55.6
Very high risk	2	5.6

**The complication during induction**

An overview of the complication for the study participants, complication was including 18% (n=23) were the infection, 13.3% (n=17) were the drug, 20.3% (n=26) were the tumor lysis syndrome, 21.1% (n=27) were the bleeding and 27.3% (n=35). Twenty-three patients of the 35 complication patients who have infection were in the following of types infections: 17.9% (n=5) were pneumonia, 25% (n=7) were gastro-intestinal, 3.6% (n=1) were urinary tract infection, 7.1% (n=2). In the infection reports were the febrile neutropenia 50% (n=23), taken hemoculture were 37% (n=17) and presents disseminated intravascular coagulation 13% (n=6). The result of hemoculture was seventeen patients including 35.3% (n=6) were growth such as: *ESBL*, *klebsilla pneumonia*, *acetobacter*, *pseudomonas* and 64.7% (n=11) were no growth. The complication of drug presented in table 4 including: 15% (n=3) were vincristine, 10 % (n=2) were L-asparaginase, 30 % (n=6) were doxorubicin, 45% (n=9) were steroid and there was not the methotrexate. Summarizes the supportive care, we found the hydration and allopurinol were 25.4% (n=36), 23.2% (n=33) were the blood transfusion, 16.3% (n=23) were antibiotic and 9.2% (n=13) were pain control (Table 4).

Table 4: Complication including infection, drug, tumor lysis syndrome, bleeding and anemia.

Variables	Frequency (n=36)	Percentage (%)
<b>Complication</b>		
Infection	23	18
Drug	17	13.3
Tumor lysis syndrome	26	20.3
Bleeding	27	21.1
Anemia	35	27.3
<b>Types of infection</b>		
Pneumonia	5	17.9
Gastro - intestinal	7	25
Urinary Tract Infection	1	3.6
Cellulitis	2	7.1
Mucositis	6	21.4
Other	7	25

Variables	Frequency (n=36)	Percentage (%)
<b>Infection (n=23)</b>		
Febrile neutropenia	23	50
Hemoculture	17	37
DIC	6	13
<b>Hemoculture (n=17)</b>		
No growth	11	64.7
Growth	6	35.3
<b>Complication of drug</b>		
Vincristine	3	15
Asparaginase	2	10
Doxorubicin	6	30
Steroid	9	45
Methotrexate	0	0
<b>Supportive care</b>		
Hydration	36	25.5
Allopurinol	36	25,5
Blood transfusion	33	23,4
Antibiotic	23	16.3
Pain control	13	9.2
<b>Cause of death</b>		
Infection	4	57.1
Bleeding	2	14.3
Tumor lysis syndrome	1	28.6

**The outcome induction**

The induction therapy presented twenty-seven patients including the gender, age and risk group of ALL, 74.1% (n=20) were male and 25.9% (n=7), < 1 year was 7.4 % (n=2), 2 and 10 years was 85.2% (n=23) and more than 10 years was 7.4% (n=2). 48.1% (n=13) were standard risk group, 48.1% (n=13) were high risk group and 3.7% (n=1) were very high risk. Finally, the survival was twenty-seven patients and taken the bone marrow aspiration for evaluation were 100%.

The outcomes presented of 36 patients who initiated treatment, after induction therapy we found 27 patients, 61.1% (n=22) patients went into the complete remission (<5% blast cells in bone marrow), 13.9% (n=5) was not in remission (>5% blast cells in the bone marrow). Seven patients died due to 57.1% (n=4) infection the pathogen of hemoculture were *acetobacter*, *klebsiella pneumonia*, *pseudomonas aeruginosa* and *ESBL*, 28.6% (n=2) bleeding and 14.3% (n=1) tumor lysis syndrome with AKI during the course of induction therapy and 2 patients were refuse of treatment including the problem of financial and family (Table 5).

Table 5: The outcomes after induction therapy

Variables	Frequency (n=36)	Percentage (%)
<b>Gender (n=27)</b>		
Male	20	74.1
Female	7	25.9
<b>Age (n=27)</b>		
1 year	2	7.4
2 and 10 years	23	85.2
more than 10 year	2	7.4
<b>Risk group of ALL</b>		
Standard risk	13	48.1
High risk	13	48.1
Very high risk	1	3.7
<b>Outcome</b>		
Remission	22	61.1
Not remission	5	13.9
Death	7	19.4
Refuse of treatment	2	5.6
<b>Cause of death</b>		
Infection	4	57.1
Bleeding	2	14.3
Tumor lysis syndrome	1	28.6

## Discussion

This is the first description of the outcomes after complete induction chemotherapy and the observation the complications between induction chemotherapy for patients pediatric ALL, who received induction chemotherapy at the main referral hospital for pediatric ALL patients in Vientiane. The study also established associations between hematological laboratory finding, sociodemographic and clinical variables of the patients.

In the present study, we found pediatric ALL have many clinical manifestations and symptoms. In our study, it was presented fever (55.4%), pallor (28.6%), hepatomegaly (21%), lymphadenopathy (20.2%), splenomegaly (15.1%) and bleeding (12.6%) were the most frequency of the clinical profile of pediatric ALL was similar the previous study at An-Najah National Hospital. For the gender was male, higher than in Children Hospital complex Mulan (68%). For the mean of age was higher than comparable to those reported in a previous study 3.28 years in 2016 at Vientiane. In Riyadh, Saudi Arabia, the lab of flow cytometry, the B-cell type is more common than the T-cell type, it was similar to the results of our study [8]. In contrast, other studies by the approximately 55.6% of patients were high risk and 38.9% with standard risk of the study in Egypt who reported 50.5% was standard risk and 49.5% of high risk., the most frequent of types infection were gastro intestinal infection, mucositis and the result of hemoculture were *klebsiella pneumonia*, *pseudomonas aeruginosa* was similar in China [15].

The total of death before the complete induction therapy that was lower than other results at Oncology Center of Mansoura University in Egypt (23%) and infection, bleeding and tumor lysis were the major of death was similar in Baghdad, the fourth death related infection had done hemoculture, the microorganism were *acetobacter*, *klebsiella pneumonia*, *pseudomonas aeruginosa* and *ESBL* was similar in Egypt [1]. Induction therapy outcome of ALL at our oncology center, the percent of remission status (61.1%) was higher than the percent of not remission status (13.9%) by the bone marrow aspiration, it was similar in Pakistan, they were the bone marrow aspiration was done in 38 (100%) and Immunophenotyping in 34 (89%) patients. At day 28 of induction therapy, 28(74%) patients went into complete remission (<5% blast cells in bone marrow), 2 (5%) into partial remission (5-25% blast cells in bone marrow) and 1(3%) was not in remission (>25% blast cells in the bone marrow). Seven patients died due to febrile neutropenia and sepsis during the course in induction therapy [13].

Some limitations are noted in our study, First, Recently, our centers have introduced minimal residual disease testing, immunohistochemistry, and flow cytometry into routine patient follow-up, aiming to enhance the accuracy of future diagnoses. Second, a limitation persists in the interpretation of bone marrow biopsy and aspiration by hematopathologists, particularly in precisely diagnosing acute lymphoblastic leukemia. Finally, our study faced challenges in estimating overall survival (OS) due to patients refusing treatment, socio-economic issues, and the high cost associated with chemotherapy.

## Limitations of study

The limitation is shared by other studies from developing countries where resources or expertise are restricted. Minimal residual, immunohistochemistry and the flow cytometry testing has recently been introduced in our centers and it has been integrated into the routine follow-up of patients. And the limitation for the pathologist of hematology to interpret the bone marrow biopsy and aspiration to exactly diagnosis acute lymphoblastic leukemia.

## Conclusion and Recommendation

The outcome of induction treatments in childhood acute lymphoblastic leukemia, the complete remission was high than the not remission, who were admitted to the hematology - oncology ward at Nation Children Hospital. The male of remission is higher (74.1%) than female (25.9%) and the most classification of risk group was high risk group. The feature of clinical ALL pediatric was fever and pallor. The majority cause of death is infection including *acetobacter*, *klebsiella pneumonia*, *pseudomonas aeruginosa* and *ESBL* for the cause of refuse treatment was financial. Addressing

shared limitations in developing countries, supporting hematopathologists for accurate bone marrow biopsy interpretation, and finding solutions to challenges in estimating overall survival, including patient refusals and socio-economic barriers, are crucial for comprehensive patient care and prognosis.

### Acknowledgements

First of all, I would like to express my deep appreciation to the Faculty of Medicine, University of Health Sciences, Laos and Department of Pediatrics of Faculty of Medicine, Khon Kaen University for their very kind supports for my Fellowship Training in the past three years. I am very grateful to all of kindly advisors for their excellent guidance, support, help and encouragement for my training and thesis. Additionally, I extend my heartfelt to the hematology-oncology ward allowed me to conduct my research in the Unit. I am very thankful to all patients and their guardians, medical staff at Children Hospital, for their excellent cooperation and participation in this research. Finally, I would like to acknowledge my colleagues and family for giving me the encouragement, love and help throughout my pediatric hematology-oncology fellowship Training.

### Reference

1. Abdelmabood S, Fouda AE, Boujettif F, Mansour A. Treatment outcomes of children with acute lymphoblastic leukemia in a middle-income developing country: high mortalities, early relapses, and poor survival. *Jornal de Pediatria (Versão em Português)*. 2020 Jan 1;96(1):108-16.
2. Baade PD, Youlten DR, Valery PC, Hassall T, Ward L, Green AC, Aitken JF. Trends in incidence of childhood cancer in Australia, 1983–2006. *British journal of cancer*. 2010 Feb;102(3):620-6.
3. Bao PP, Zheng Y, Wang CF, Gu K, Jin F, Lu W. Time trends and characteristics of childhood cancer among children age 0–14 in Shanghai. *Pediatric blood & cancer*. 2009 Jul 15;53(1):13-6.
4. Bunyatisai W, Jia-Mahasap B, Chitapanarux I. Treatment outcomes of acute lymphoblastic leukemia in both children and adults using the Thai Pediatric Oncology Group-based protocol at Chiang Mai University Hospital. *Journal of Thai Association of Radiation Oncology*. 2019 Jun 27;25(1):12-28.
5. Desandes E, Clavel J, Berger C, Bernard JL, Blouin P, de Lumley L, Demeocq F, Freycon F, Gembara P, Goubin A, Le Gall E. Cancer incidence among children in France, 1990–1999. *Pediatric blood & cancer*. 2004 Dec;43(7):749-57.
6. Dreifaldt AC, Carlberg M, Hardell L. Increasing incidence rates of childhood malignant diseases in Sweden during the period 1960–1998. *European journal of cancer*. 2004 Jun 1;40(9):1351-60.
7. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, Parkin DM, Forman D, Bray F. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *International journal of cancer*. 2015 Mar 1;136(5):E359-86.
8. Kasonkanji E, Kimani S, Skiver B, Ellis G, Seguin R, Kaimila B, Tomoka T, Mulenga M, Montgomery N, Fedoriw Y, Gopal S. Clinical Characteristics and Outcomes of Acute Lymphoblastic Leukemia in Adolescents and Young Adults in Malawi. *JCO Global Oncology*. 2022 Jun;8:e2100388.
9. Khazaei Z, Goodarzi E, Adineh HA, Moradi Y, Sohrabivafa M, Darvishi I, Dehghani SL. Epidemiology, incidence, and mortality of leukemia in children early infancy to 14 years old of age in South-Central Asia: A Global Ecological Study. *Journal of Comprehensive Pediatrics*. 2019;10(1).
10. Linabery AM, Ross JA. Trends in childhood cancer incidence in the US (1992–2004). *Cancer: Interdisciplinary International Journal of the American Cancer Society*. 2008 Jan 15;112(2):416-32.
11. Li SD, Chen YB, Li ZG, Wu RH, Qin MQ, Zhou X, Jiang J, Zhang RD, Xie J, Ma XL, Zhang R. Infections during induction therapy of protocol CCLG-2008 in childhood acute lymphoblastic leukemia: a single-center experience with 256 cases in China. *Chinese medical journal*. 2015 Feb 20;128(04):472-6.
12. Puckett Y, Chan O. Acute lymphocytic leukemia.
13. Rana ZA, Rabbani MW, Sheikh MA, Khan AA. Outcome of childhood acute lymphoblastic leukaemia after induction therapy 3 years experience at a single paediatric oncology centre. *Journal of Ayub Medical College Abbottabad*. 2009 Dec 1;21(4):150-3.
14. Siegel R, DeSantis C, Virgo K, Stein K, Mariotto A, Smith T, Cooper D, Gansler T, Lerro C, Fedewa S, Lin C. Cancer treatment and survivorship statistics, 2012. *CA: a cancer journal for clinicians*. 2012 Jul;62(4):220-41.
15. Stack M, Walsh PM, Comber H, Ryan CA, O'Lorcain P. Childhood cancer in Ireland: a population-based study. *Archives of disease in childhood*. 2007 Jun 12.

# ຜົນໄດ້ຮັບການປິ່ນປົວຂອງຄົນເຈັບມະເຮັງເມັດເລືອດຂາວແບບກະທັນຫັນ ໃນເດັກໃນໄລຍະ induction, ທີ່ໂຮງໝໍເດັກ, ນະຄອນຫຼວງວຽງຈັນ, ສປປ ລາວ

ທັດສະດາພອນ ຊຸນໂນລາດ<sup>1</sup>, ພັດສະລີ ກິມວິໄລສັກ<sup>2</sup>, ບຸນປະລິສອນ ສຸວັນລາສີ<sup>3</sup>, ສຸລິເດດ ແສງຈັນ<sup>1</sup>

1. ຄະນະແພດສາດ, ມະຫາວິທະຍາໄລ ວິທະຍາສາດ ສຸຂະພາບ, ນະຄອນຫຼວງວຽງຈັນ, ສປປ ລາວ
2. ຄະນະແພດສາດ, ມະຫາວິທະຍາໄລຂອນແກ່ນ, ປະເທດໄທ
3. ພະແນກເລືອດ ແລະ ມະເຮັງ, ໂຮງໝໍເດັກ, ນະຄອນຫຼວງວຽງຈັນ, ສປປ ລາວ

ໄດ້ຮັບຕົ້ນສະບັບ ທີ 18 ກໍລະກົດ 2022, ໄດ້ຮັບບົດທີ່ກວດແກ້ຄືນ ທີ 20 ພະຈິກ 2023, ເຫັນດີໃຫ້ຈັດພິມ 25 ພະຈິກ 2023

## ບົດຄັດຫຍໍ້

**ເຫດຜົນ ແລະ ຄວາມສໍາຄັນ:** ພະຍາດມະເຮັງແມ່ນໜຶ່ງໃນສາເຫດຂອງການເສຍຊີວິດໃນເດັກນ້ອຍ. ອັດຕາການເກີດມະເຮັງໃນເດັກນ້ອຍທີ່ມີອາຍຸຕໍ່າກວ່າ 15 ປີ ແຕກຕ່າງກັນໄປທົ່ວໂລກ. ເຖິງວ່າຈະມີຄວາມກ້າວໜ້າທີ່ສໍາຄັນໃນການປິ່ນປົວແລະການກວດພົບໄວ້, ມະເຮັງກໍຍັງແມ່ນສາເຫດສໍາຄັນທີ່ສອງຂອງການຕາຍຂອງເດັກນ້ອຍໃນປະເທດທີ່ພັດທະນາແລ້ວ. ໃນບາງປະເທດທີ່ພັດທະນາແລ້ວ ເຊັ່ນ: ອົດສະຕຣາລີ, ໄອແລນ, ສະວິດເຊີແລນ ແລະ ສະຫະລັດອາເມລິກາ, ອັດຕາການເກີດເປັນມະເຮັງໃນເດັກແມ່ນປະມານ 140 - 160 ຄົນຕໍ່ເດັກນ້ອຍ 1 ລ້ານຄົນ.

**ຈຸດປະສົງ:** ເພື່ອສຶກສາຜົນການປິ່ນປົວຂອງຄົນເຈັບມະເຮັງເມັດເລືອດຂາວແບບກະທັນຫັນ ໃນເດັກໃນໄລຍະ induction, ທີ່ໂຮງໝໍເດັກ, ນະຄອນຫຼວງວຽງຈັນ, ສປປ ລາວ.

**ວິທີວິທະຍາການຄົ້ນຄວ້າ:** ການສຶກສາພັນລະນາໄປທາງໜ້າ (Prospective descriptive study) ທີ່ພະແນກເລືອດ ແລະ ມະເຮັງຂອງໂຮງໝໍເດັກ, ຕັ້ງແຕ່ເດືອນທັນວາ ປີ 2021 ຫາ ເດືອນພະຈິກ ປີ 2022, ເງື່ອນໄຂໃນການເຂົ້າຮ່ວມການສຶກສາໃນຄັ້ງນີ້ແມ່ນຄົນເຈັບໄຫມທີ່ຖືກບົ່ງມະຕິ Acute lymphoblastic leukemia ແລະ ໄດ້ຮັບການປິ່ນປົວດ້ວຍຢາເຄມີບໍາບັດໃນຊ່ວງໄລຍະ induction.

**ຜົນການຄົ້ນຄວ້າ:** ຜູ້ເຂົ້າຮ່ວມຈຳນວນ 36 ຄົນ ເຊິ່ງແມ່ນເພດຊາຍຫຼາຍກວ່າເພດຍິງ, ຂໍ້ມູນທາງດ້ານຄລິນິກທີ່ສະແດງໃຫ້ເຫັນວ່າອາການໄຂ້ ແລະ ຈິດມ້ານແມ່ນພົບເລື້ອຍທີ່ສຸດ, ຊຶ່ງໃນການປິ່ນປົວໃນໄລຍະ induction ແມ່ນພົບເຫັນວ່າ ມີອາການສົນຂອງການປິ່ນປົວແບບສະເພາະທາງ (ການໃຫ້ເຄມີບໍາບັດ) ແລະ ການປິ່ນປົວແບບ ປະຄັບປະຄອງ. ພົບເຫັນວ່າ ມີອັດຕາການເສຍຊີວິດແມ່ນ 7 ຄົນ (19.4%), ຊຶ່ງສາດເຫດການເສຍຊີວິດແມ່ນເກີດຈາກການຕິດເຊື້ອຂອງເຊື້ອພະຍາດຈາກລາຍງານຂອງຜົນປູກເລືອດ ແມ່ນພົບເຊື້ອ *acetobacter*, *klebsiella pneumonia*, *pseudomonas aeruginosa* and *ESBL*, ພາວະເລືອດໄຫຼ ແລະ ພາວະ tumor lysis. ຫຼັງຈາກການປິ່ນປົວດ້ວຍ induction ພົບວ່າມີຄົນເຈັບ 22 ຄົນ (61.1%) ທີ່ມີການສະຫງົບຂອງພະຍາດ (< 5% ຈຸລັງ blast ໃນແອັກະດູກ), ຈຳນວນ 5 ຄົນ (13.9%) ບໍ່ມີການສະຫງົບຂອງພະຍາດ (> 5% ຈຸລັງ blast ໃນແອັກະດູກ). ຄົນເຈັບ 7 ຄົນ (19.4%) ເສຍຊີວິດ ແລະ ຄົນເຈັບ 2 ຄົນມີການປະຕິເສດການປິ່ນປົວເຊິ່ງມີບັນຫາທາງດ້ານເສດຖະກິດການເງິນ ແລະ ມີຄວາມຫຍຸ້ງຍາກທາງດ້ານຄອບຄົວ.

**ສະຫຼຸບ:** ອັດຕາການຂອງການສະຫງົບຂອງພະຍາດ ແລະ ອັດຕາການຕາຍໃນໄລຍະ induction ແມ່ນສູງ, ສ່ວນຫລາຍແມ່ນພົບໃນເພດຊາຍຫຼາຍກວ່າເພດຍິງ ຊຶ່ງພົບໃນກຸ່ມຂອງ high risk ກວ່າກຸ່ມອື່ນ. ອາການສະແດງຂອງພະຍາດເມັດເຮັງເມັດເລືອດຂາວແບບກະທັນຫັນ ໃນເດັກທີ່ພົບແພດແມ່ນ ອາການໄຂ້ ແລະ ອາການຈິດມ້ານ. ສ່ວນສາເຫດຂອງການຕາຍແມ່ນຈາກການຕິດເຊື້ອ.

**ຄໍາສັບຫຼັກ:** ມະເຮັງເມັດເລືອດຂາວແບບກະທັນຫັນ, ການປູກເລືອດ, ການປິ່ນປົວດ້ວຍເຄມີບໍາບັດ, ໂຮງໝໍເດັກ  
\*ຕິດຕໍ່ກັບຜູ້ຂຽນ: ທັດສະດາພອນ ຊຸນໂນລາດ, ເບີໂທ: +85620 7771 9779; ອີເມວ: thatsadaphoneknr@gmail.com