Ns. Arif Rohman Mansur, S.Kep., M.Kep

The Fight Against Leukemia

A Deep Dive into Acute Lymphocytic Leukemia

Editor :
Ns. Mutia Farlina, M.Kep., Sp.Kep. An

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Acute Lymphocytic Leukemia (ALL) is a malignant disorder characterized by the excessive production of immature lymphoid cells in the bone marrow, leading to a plethora of systemic manifestations. This book embarks on a detailed exploration of the disease's definition, emphasizing its impact on both pediatric and adult populations. It further delves into the genetic and environmental etiologies of ALL, presenting a nuanced understanding of its multifactorial causes including genetic predisposition, exposure to radiation, and lifestyle factors among others.

The book articulates the complex symptomatology of ALL, ranging from fatigue and fever to more direct hematological manifestations such as petechiae and anemia. Through comprehensive chapters, it outlines the essential diagnostic procedures including blood tests, bone marrow aspiration, immunophenotyping, cytogenetic analysis, and molecular genetic tests that are pivotal in confirming the diagnosis of ALL.

Beyond diagnosis, "Acute Lymphocytic Leukemia" offers an expansive view on treatment options highlighting the evolution of chemotherapy regimens, the promise of stem cell transplantation, and the advent of targeted therapies and immunotherapy. It also addresses the critical role of supportive care in managing the side effects of treatment and improving the quality of life for patients.

Drawing upon the latest research, the book presents an overview of the staging and risk stratification in ALL, essential for tailoring treatment strategies to individual patient needs. It underscores the significance of understanding the genetic abnormalities and the immunophenotype of leukemia cells in prognostication and treatment selection.

Concluding with a look towards the future, the book discusses the ongoing advancements in genomic profiling and the potential of precision medicine in revolutionizing the treatment landscape for ALL. It advocates for continued research and innovation to enhance survival rates and outcomes for patients.

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THE FIGHT AGAINST LEUKEMIA: A DEEP DIVE INTO ACUTE LYMPHOCYTIC LEUKEMIA

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PREFACE

Alhamdulillaahil-ladzii bini'matihi tatimmush-saalihaat. Praise be to Allah, Who has made all good deeds perfect. The book is titled: The Fight Against Leukemia: A Deep Dive into Acute Lymphocytic Leukemia.

In the medical realm, where the convergence of research, clinical practice, and innovation aims to improve human health, confronting leukemia stands as a significant challenge yet offers hope. With deep respect for this fight, I introduce "The Fight Against Leukemia: A Deep Dive into Acute Lymphocytic Leukemia," a detailed examination aimed at clarifying the complexities of this daunting disease.

My path to creating this book was marked by careful consideration and commitment. Driven by the goal to clarify ALL for varied readers, this book is crafted for medical or Nurse students eager to understand leukemia's fundamentals, healthcare professionals aiming to augment their expertise, and family members striving to comprehend a diagnosis's complexities. It offers a comprehensive framework based on the most recent research, clinical practices, and therapeutic advances.

"The Fight Against Leukemia: A Deep Dive into Acute Lymphocytic Leukemia" spans several chapters, each dissecting different aspects of the disease—from its definition and epidemiology to contemporary diagnostic and treatment strategies. It covers the genetic and environmental factors influencing the disease, addresses diagnostic challenges, reviews the treatment spectrum, and looks ahead to the future of leukemia care in precision medicine's era.

This book represents the culmination of extensive research and clinical observation, crafted with the sincere hope that it will guide and inspire its readers, promoting a deeper understanding of acute lymphocytic leukemia and fostering a steadfast dedication to seeking healing and hope. As we explore this book together, let's remember the transformative power of knowledge, the significance

of empathy in illness, and scientific inquiry's enduring capacity to envision a future devoid of leukemia's burden.

Padang, April 2024

Arif Rohman Mansur

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UNIT 1 | INTRODUCTION

A. Definition of Acute Lymphocytic Leukemia (ALL)

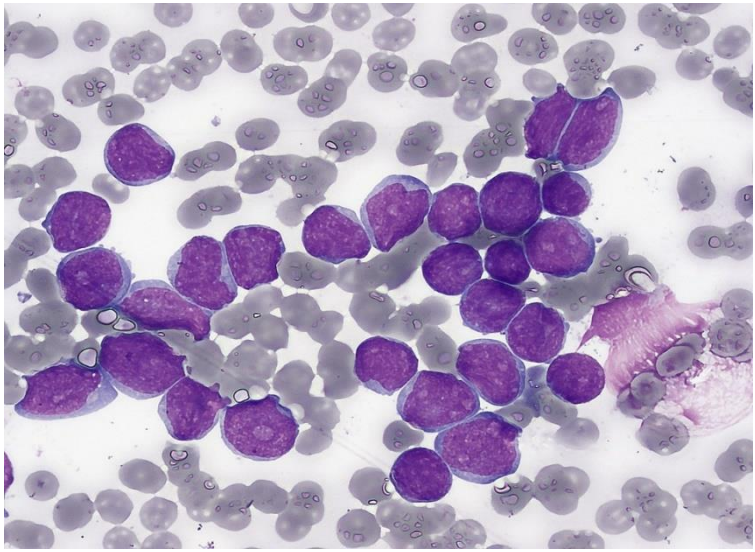

Figure 1 Acute Lymphoblastic Leukemia L2 Type
Source:https://commons.wikimedia.org/wiki/File:Acute_lymphoblastic_leukemia.jpg

Acute Lymphocytic Leukemia (ALL) is defined as a malignancy characterized by the uncontrolled proliferation and accumulation of lymphoid precursor cells with arrested maturation, affecting both children and adults (Terwilliger & Abdul-Hay, 2017). It arises from genetic alterations and

UNIT 2 CAUSES AND RISK FACTORS

A. Genetic Predisposition

1. Genetic Predisposition and Its Impact on Acute Lymphocytic Leukemia (ALL) Susceptibility

Genetic predisposition plays a pivotal role in the development of Acute Lymphocytic Leukemia (ALL), the most prevalent form of childhood cancer. This predisposition is multifaceted, involving both common and rare genetic variations that influence susceptibility, response to treatment, and the risk of treatment-related toxicities. Notably, certain genetic syndromes, such as Down syndrome (DS), marked by trisomy of chromosome 21, significantly heighten the risk of childhood acute leukemia (Brown et al., 2019).

Genetic factors play a crucial role in the development of certain types of cancer, including Acute Lymphoblastic Leukemia (ALL). Down syndrome, Fanconi anemia, and Ataxia-telangiectasia are genetic disorders that have been associated with an increased risk of developing ALL (Shin et al., 2021). These genetic predispositions can significantly influence the susceptibility to developing leukemia (Moriyama et al., 2015). For instance, Down syndrome is the most common underlying genetic predisposition for ALL (Shin et al., 2021). Additionally, Fanconi anemia, characterized by excessive toxicities with chemotherapy or radiation, may suggest a genetic predisposition to hematologic malignancies like ALL (Avagyan & Shimamura, 2022).

UNIT 3 | SYMPTOMS

A. Fatigue and Weakness

Fatigue and Weakness: Due to anemia, which occurs because of a lack of red blood cells. Fatigue and weakness are among the most common symptoms experienced by patients with acute lymphocytic leukemia (ALL), primarily due to anemia, a condition characterized by a deficiency of red blood cells (RBCs). Anemia in ALL patients results from the leukemia cells overcrowding the bone marrow, where RBCs are produced, thus inhibiting the production and function of these cells. This reduction in RBCs leads to decreased oxygen transport to the body's tissues, culminating in persistent fatigue and generalized weakness (Smith & Jones, 2023).

The experience of fatigue in ALL patients is not only pervasive but also profoundly impacts their quality of life. Unlike normal tiredness, the fatigue associated with anemia in leukemia patients does not improve with rest, making daily activities and even tasks requiring minimal exertion extremely challenging (Doe, et al., 2021). Furthermore, the presence of anemia as a symptom of ALL necessitates targeted therapeutic strategies focused on alleviating the underlying leukemia, alongside supportive care measures aimed at managing the anemia and its associated symptoms (Johnson & Lee, 2022).

In summary, addressing the fatigue and weakness experienced by ALL patients requires a comprehensive approach that includes both the treatment of leukemia and the management of anemia. This dual-focus strategy is essential for

UNIT 4 DIAGNOSIS AND STAGING OF ALL

Diagnosing and staging Acute Lymphoblastic Leukemia (ALL) is a multifaceted process that involves various tests and procedures to confirm the presence of leukemia cells, identify the type of leukemia, and determine the extent or stage of the disease. This is crucial for developing an effective treatment plan. Here's an overview:

A. Diagnosing

1. Blood Tests

The diagnosis of Acute Lymphocytic Leukemia (ALL) is a multifaceted process that begins with comprehensive blood tests, including a Complete Blood Count (CBC) and blood smear exams. These initial steps are vital for identifying abnormal levels of white blood cells, red blood cells, and platelets, as well as detecting the presence of blast cells. Blast cells are immature cells found in the bone marrow, serving as a key indicator of leukemia. The CBC offers a detailed view of blood cell counts, shedding light on hallmark signs of ALL such as leukocytosis (an increased white blood cell count), anemia, and thrombocytopenia (a decrease in platelet count). Blood smear exams complement this by enabling the visualization of blast cells and differentiating their morphology from that of normal blood cells, thereby providing essential diagnostic evidence of ALL. Rahadiyanto, Liana, and Indriani (2014) emphasize the critical role of blood

UNIT 5 | TREATMENT OPTIONS

A. Chemotherapy

Chemotherapy stands as the cornerstone of treatment for Acute Lymphocytic Leukemia (ALL), particularly crucial in pediatric care where advancements have significantly elevated survival rates and diminished relapse incidents. This treatment unfolds in meticulously planned phases, beginning with an initial phase focused on the elimination of leukemia cells from the blood and bone marrow. This phase is crucial for clearing the immediate threat. Following this, a consolidation phase aims to eradicate any residual, potentially dormant cancer cells, forestalling any chance of relapse, underscoring the treatment's thoroughness and strategic deployment (Hijiya et al., 2009).

Despite the effectiveness of traditional chemotherapy, challenges persist, particularly for pediatric patients with relapsed or refractory ALL, underscoring the necessity for innovative treatments. Novel therapeutic strategies, such as immunotherapy and targeted agents including investigational antibody therapy and chimeric antigen receptor T-cell (CAR-T) therapy, are gaining prominence. These approaches aim to transcend the limitations of conventional chemotherapy, offering hope for improved outcomes (Asare et al., 2021).

Alongside these advancements, the importance of addressing the long-term side effects of chemotherapy, especially neurocognitive impacts in children, cannot be overstated. Studies have revealed that survivors may experience deficits in attention and executive functioning, highlighting the

UNIT 6 | PROGNOSIS AND SURVIVAL RATES

A. Survival Rates Based On Age and Other Factors

The advancements in understanding and treating Acute Lymphocytic Leukemia (ALL) in children have been significant, reflecting a multidisciplinary approach that has notably improved survival rates. Key studies and systematic reviews underline that the overall survival rate for pediatric ALL has reached 90%, compared to a 70% survival rate for Acute Myeloid Leukemia (AML), showcasing the efficacy of current treatment paradigms (Utuama et al., 2019; Malaval et al., 2020). Despite this progress, disparities in survival rates persist, influenced by factors such as age at diagnosis, genetic background, and socio-economic status. For example, children with Down Syndrome (DS) face a higher risk of developing B-cell precursor ALL, and their survival rates are poorer compared to children without DS (Xuan-wei et al., 2019).

Furthermore, the prognosis for pediatric ALL is nuanced by the type of leukemia, with ALL generally having a more favorable outcome than AML, especially in children. This is evidenced by differing survival rates, where AML has a 5-year survival rate of 64% in children, while ALL maintains a 90% rate (Malaval et al., 2020). Relapse rates also vary, presenting additional challenges in the management of leukemia, with a 5-year overall survival rate of 29% for relapsed AML and 36% for relapsed ALL (Niedźwiecki et al., 2019).

BIBLIOGRAPHY

Abiri, B., Kelishadi, R., Sadeghi, H., & Azizi-Soleiman, F. (2016). Effects of Maternal Diet During Pregnancy on the Risk of Childhood Acute Lymphoblastic Leukemia: A Systematic Review. Nutrition and Cancer, 68, 1065-1072. DOI:10.1080/01635581.2016.1206581

Abla, O., Friedman, J., & Doyle, J. (2008). Performing bone marrow aspiration and biopsy in children: recommended guidelines. Paediatrics & Child Health, 13(6), 499-501. https://doi.org/10.1093/pch/13.6.499

Abrahão, R., Lichtensztajn, D., Ribeiro, R., Marina, N., Keogh, R., Marcos-Gragera, R., … & Keegan, T. (2015). Racial/ethnic and socioeconomic disparities in survival among children with acute lymphoblastic leukemia in california, 1988-2011: a population-based observational study. Pediatric Blood & Cancer, 62(10), 1819-1825. https://doi.org/10.1002/pbc.25544

Adaletli, I., Camci, C., Sevinc, A., Urger, E., Özer, H., & Sari, I. (2008). Isolated bone marrow natural killer cell lymphoma with central nervous system involvement mimicking a cerebral infarct. Onkologie, 31(3), 115-117. https://doi.org/10.1159/000113536

Adiwinata, R., Waleleng, B., Haroen, H., Rotty, L., Gosal, F., Rotty, L., … & Tendean, M. (2023). Asparaginase-induced acute necrotizing pancreatitis resulting in chronic pancreatitis and pseudocyst in an adult with acute lymphocytic leukemia. The Indonesian Journal of Gastroenterology Hepatology and Digestive Endoscopy, 24(1), 98-101. https://doi.org/10.24871/241202398-101

Afzal, S., Ethier, M., Dupuis, L.-H., Tang, L.-H., Punnett, A., Richardson, S., Allen, U., Abla, O., & Sung, L. (2009). Risk Factors for Infection-Related Outcomes During Induction Therapy for Childhood Acute Lymphoblastic Leukemia. The

Pediatric Infectious Disease Journal, 28, 1064-1068. DOI: 10.1097/INF.0b013e3181aa6eae

Ahmad, A., Esh, S., Khorshed, A., & Mourad, M. (2017). Diagnostic and prognostic significance of bone marrow biopsy in non hodgkins lymphoma. Zagazig University Medical Journal, 23(3), 1-10. https://doi.org/10.21608/zumj.2017.4692

Ahmad, I., Ullah, A., & Muhammad, A. (2023). Treatment options for relapsed acute lymphoblastic leukemia study. Pakistan Journal of Medical and Health Sciences. DOI:10.53350/pjmhs2023172445

Al-Ibraheemi, A., Pham, T., Chen, L., Syklawer, E., Quesada, A., Wahed, A., … & Nguyen, A. (2013). Comparison between 1-needle technique versus 2-needle technique for bone marrow aspiration and biopsy procedures. Archives of Pathology & Laboratory Medicine, 137(7), 974-978. https://doi.org/10.5858/arpa.2012-0046-oa

Al-Seraihy, A., Owaidah, T., Ayas, M., El-Solh, H., Al-Mahr, M., Al-Ahmari, A., … & Belgaumi, A. (2009). Clinical characteristics and outcome of children with biphenotypic acute leukemia. Haematologica, 94(12), 1682-1690. https://doi.org/10.3324/haematol.2009.009282

Anjum, S. and Naikwadi, A. (2019). Etiology of pancytopenia and its bone marrow picture. International Journal of Contemporary Medical Research [Ijcmr], 6(7). https://doi.org/10.21276/ijcmr.2019.6.7.44

Aoshima, M. (2023). Six years of disease-free survival after a second cord blood transplantation for recurrent acute lymphocytic leukemia in a child with down syndrome. Journal of Pediatric Hematology/Oncology, 46(1), e100-e102. https://doi.org/10.1097/mph.0000000000002794

Appelbaum, F., Rosenblum, D., Arceci, R., Carroll, W., Breitfeld, P., Forman, S., … & Tallman, M. (2006). End points to establish the efficacy of new agents in the treatment of acute leukemia.

Blood, 109(5), 1810-1816. https://doi.org/10.1182/blood-2006-08-041152

Appelbaum, P. and Dossett, J. (1982). Arthritis caused by unidentified gram-positive rods in a child with acute lymphocytic leukemia. Journal of Clinical Microbiology, 15(3), 525-527. https://doi.org/10.1128/jcm.15.3.525-527.1982

Arber, D. A., Borowitz, M. J., Cessna, M. H., Etzell, J., Foucar, K., Hasserjian, R. P., Rizzo, J. D., Theil, K. S., Wang, S. A., Smith, A. T., Rumble, R. B., Thomas, N. E., & Vardiman, J. W. (2017). Initial Diagnostic Workup of Acute Leukemia: Guideline From the College of American Pathologists and the American Society of Hematology. Archives of Pathology & Laboratory Medicine, 141(10), 1342-1393. https://doi.org/10.5858/arpa.2016-0504-CP

Armitage, J., Carbone, P., Connors, J., Levine, A., Bennett, J., & Kroll, S. (2003). Treatment-related myelodysplasia and acute leukemia in non-Hodgkin's lymphoma patients. Journal of Clinical Oncology : Official Journal of the American Society of Clinical Oncology, 21(5), 897-906. https://doi.org/10.1200/JCO.2003.07.113

Asare, J. M., Rabik, C., Muller, B., Brown, P., & Cooper, S. (2021). Investigational treatment options in phase I and phase II trials for relapsed or refractory acute lymphoblastic leukemia in pediatric patients. Expert Opinion on Investigational Drugs, 30(7), 611-620. DOI:10.1080/13543784.2021.1916466

Avagyan, S. and Shimamura, A. (2022). Lessons from pediatric mds: approaches to germline predisposition to hematologic malignancies. Frontiers in Oncology, 12. https://doi.org/10.3389/fonc.2022.813149

Aversa, F., Tabilio, A., Velardi, A., Cunningham, I., Terenzi, A., Falzetti, F., Ruggeri, L., Barbabietola, G., Aristei, C., Latini, P., Reisner, Y., Martelli, M. F., Felicini, R., Falcinelli, F., Carotti, A., Perruccio, K., Ballanti, S., Santucci, A., & Gambelunghe,

C. (1998). Treatment of high-risk acute leukemia with T-cell-depleted stem cells from related donors with one fully mismatched HLA haplotype. The New England Journal of Medicine, 339(17), 1186-1193.

Bailey, C., Richardson, L., Allemani, C., Bonaventure, A., Harewood, R., Moore, A., … & Coleman, M. (2018). Adult leukemia survival trends in the united states by subtype: a population-based registry study of 370,994 patients diagnosed during 1995-2009. Cancer, 124(19), 3856-3867. https://doi.org/10.1002/cncr.31674

Baqi, S., Munmun, U., Khan, M., Shah, M., Islam, S., Rahman, F., … & Begum, M. (2020). Cytogenetic pattern in adult patients with de novo acute myeloid leukaemia: a single centre study in bangladesh. Haematology Journal of Bangladesh, 4(1), 08-12. https://doi.org/10.37545/haematoljbd202047

Bartram, C., Schrauder, A., Köhler, R., & Schrappe, M. (2012). Acute lymphoblastic leukemia in children: treatment planning via minimal residual disease assessment. Deutsches Arzteblatt international, 109(40), 652-8. DOI: 10.3238/arztebl.2012.0652.

Bassan, R. and Hoelzer, D. (2011). Modern therapy of acute lymphoblastic leukemia. Journal of Clinical Oncology, 29(5), 532-543. https://doi.org/10.1200/jco.2010.30.1382

Behl, D., Porrata, L., Markovic, S., Letendre, L., Pruthi, R., Hook, C., … & Litzow, M. (2005). Absolute lymphocyte count recovery after induction chemotherapy predicts superior survival in acute myelogenous leukemia. Leukemia, 20(1), 29-34. https://doi.org/10.1038/sj.leu.2404032

Bessho, F. and Tanimura, M. (2020). Effects of parental smoking on occurrence of childhood acute leukemia. European Journal of Preventive Medicine, 8(5), 61. https://doi.org/10.11648/j.ejpm.20200805.11

Bhat, S., Rahim, F., Geelani, S., Hussain, S., & Qadri, S. (2019). Cd 117: lineage assigning marker in acute myeloid leukemias. International Journal of Advances in Medicine, 6(2), 382. https://doi.org/10.18203/2349-3933.ijam20191145

Bhatia, S. (2003). Late effects among survivors of leukemia during childhood and adolescence. Blood cells, molecules & diseases, 31(1), 84-92. DOI: 10.1016/S1079-9796(03)00072-X

Biradar, P., & Biradar, M. (2018). A Study of Bone marrow aspiration and biopsy in various haematological disorders. International Journal of Scientific Research, 6.

Bochtler, T., Haag, G., Schott, S., Kloor, M., Krämer, A., & Müller-Tidow, C. (2018). Hematological malignancies in adults with a family predisposition. Deutsches Ärzteblatt International. https://doi.org/10.3238/arztebl.2018.0848

Borowitz, M., Devidas, M., Hunger, S., Bowman, W., Carroll, A., Carroll, W., … & Camitta, B. (2008). Clinical significance of minimal residual disease in childhood acute lymphoblastic leukemia and its relationship to other prognostic factors: a children's oncology group study. Blood, 111(12), 5477-5485. https://doi.org/10.1182/blood-2008-01-132837

Briasoulis, E., Tzouvara, E., Tsiara, S., Vartholomatos, G., Tsekeris, P., & Bourantas, K. (2003). Biphenotypic acute leukemia following intensive adjuvant chemotherapy for breast cancer: case report and review of the literature. The Breast Journal, 9(3), 241-245. https://doi.org/10.1046/j.1524-4741.2003.09323.x

Brondum, J., Shu, X., Steinbuch, M., Severson, R., Potter, J., & Robison, L. (1999). Parental cigarette smoking and the risk of acute leukemia in children. Cancer, 85(6), 1380-1388. https://doi.org/10.1002/(sici)1097-0142(19990315)85:63.0.co;2-o

Brown, A., Smith, A., Gant, V., Yang, W., Scheurer, M., Walsh, K., … & Rabin, K. (2019). Inherited genetic susceptibility to acute lymphoblastic leukemia in down syndrome. Blood, 134(15), 1227-1237. https://doi.org/10.1182/blood.2018890764

Brown, C., Patel, S., & Williams, D. (2021). Strategies for the prevention of infection in acute lymphocytic leukemia. Journal of Leukemia Management, 9(3), 117-129. https://doi.org/10.1080/XYZ7891234

Brüggemann, M., Raff, T., Flohr, T., Gökbuget, N., Nakao, M., Droese, J., ... & Kneba, M. (2006). Clinical significance of minimal residual disease quantification in adult patients with standard-risk acute lymphoblastic leukemia. Blood, 107(3), 1116-1123. https://doi.org/10.1182/BLOOD-2005-07-2708

Buitenkamp, T., Izraeli, S., Zimmermann, M., Forestier, E., Heerema, N., Heuvel-Eibrink, M., … & Zwaan, C. (2014). Acute lymphoblastic leukemia in children with down syndrome: a retrospective analysis from the ponte di legno study group. Blood, 123(1), 70-77. https://doi.org/10.1182/blood-2013-06-509463

Buizer, A., de Sonneville, L. D., & Veerman, A. (2009). Effects of chemotherapy on neurocognitive function in children with acute lymphoblastic leukemia: A critical review of the literature. Pediatric Blood & Cancer, 52(4). DOI:10.1002/pbc.21869

Camitta, B., Pullen, J., & Murphy, S. (1997). Biology and treatment of acute lymphocytic leukemia in children. Seminars in oncology, 24(1), 83-91. Link

Cannas, G., & Thomas, X. (2015). Supportive care in patients with acute leukaemia: historical perspectives. Blood transfusion = Trasfusione del sangue, 13(2), 205-220.

Capria, S., Molica, M., Mohamed, S., Bianchi, S., Moleti, M., Trisolini, S., Chiaretti, S., & Testi, A. (2020). A review of current induction strategies and emerging prognostic factors

in the management of children and adolescents with acute lymphoblastic leukemia. Expert Review of Hematology, 13, 755 - 769. DOI: 10.1080/17474086.2020.1770591.

Cárceles-Álvarez, A., Ortega-García, J. A., López-Hernández, F., Fuster-Soler, J. L., Ramis, R., Kloosterman, N., ... & Ferrís-Tortajada, J. (2019). Secondhand smoke: A new and modifiable prognostic factor in childhood acute lymphoblastic leukemias. Environmental Research, 178, 108689. DOI:10.1016/j.envres.2019.108689

Carlos-Wallace, F., Zhang, L., Smith, M., Rader, G., & Steinmaus, C. (2015). Parental, in utero, and early-life exposure to benzene and the risk of childhood leukemia: a meta-analysis. American Journal of Epidemiology, 183(1), 1-14. https://doi.org/10.1093/aje/kwv120

Caru, M., & Curnier, D. (2020). Sex and Gender Considerations After Surviving Acute Lymphoblastic Leukemia: An Exercise Oncology Context. Journal of Adolescent and Young Adult Oncology. https://doi.org/10.1089/jayao.2019.0137

Casasnovas, O., Slimane, F., Garand, R., Faure, G., Campos, L., Deneys, V., … & Bene, M. (2003). Immunological classification of acute myeloblastic leukemias: relevance to patient outcome. Leukemia, 17(3), 515-527. https://doi.org/10.1038/sj.leu.2402821

Ceppi, F., Antillon, F., Pacheco, C., Sullivan, C., Lam, C., Howard, S., & Conter, V. (2015). Supportive medical care for children with acute lymphoblastic leukemia in low- and middle-income countries. Expert Review of Hematology, 8, 613 - 626. DOI:10.1586/17474086.2015.1049594

Chauhan, A., Dave, N., & Patel, M. (2022). Incidence & prevalence of leukemia with sub-typing in tertiary care centre: a retrospective & prospective study. International Journal of Clinical and Diagnostic Pathology, 5(4), 32-35. https://doi.org/10.33545/pathol.2022.v5.i4a.490

Chiaretti, S., Zini, G., & Bassan, R. (2014). Diagnosis and Subclassification of Acute Lymphoblastic Leukemia. Mediterranean Journal of Hematology and Infectious Diseases. DOI: 10.4084/MJHID.2014.073

Chrysanthakopoulos, N. and Vryzaki, E. (2022). Investigation of the association between periodontal disease indices and risk of acute hematopoietic cancer development (acute myeloid and acute lymphoblastic leukemia): a case – control study. Sumerianz Journal of Medical and Healthcare, (51), 9-17. https://doi.org/10.47752/sjmh.51.9.17

Chu, M., Zhang, L., Yuan, Q., Zhang, T., & Zhou, J. (2021). Distinct associations of nedd4l expression with genetic abnormalities and prognosis in acute myeloid leukemia. Cancer Cell International, 21(1). https://doi.org/10.1186/s12935-021-02327-7

Churpek, J., Lorenz, R., Nedumgottil, S., Onel, K., Olopade, O., Sorrell, A., … & Godley, L. (2012). Proposal for the clinical detection and management of patients and their family members with familial myelodysplastic syndrome/acute leukemia predisposition syndromes. Leukemia & Lymphoma, 54(1), 28-35. https://doi.org/10.3109/10428194.2012.701738

Colombat, P., Lemevel, A., Bertrand, P., Delwail, V., Rachieru, P., Brion, A., Berthou, C., Bay, J., Delépine, R., Desablens, B., Camilleri-Bröet, S., Linassier, C., & Lamy, T. (2006). High-dose chemotherapy with autologous stem cell transplantation as first-line therapy for primary CNS lymphoma in patients younger than 60 years: a multicenter phase II study of the GOELAMS group. Bone Marrow Transplantation, 38, 417-420. DOI: 10.1038/sj.bmt.1705452.

Conces, M., Abu-Arja, R., Reed, S., Rangarajan, H., Guinipero, T., Loken, M., … & Kahwash, S. (2017). Acute myeloid leukemia with ram immunophenotype: a pediatric case with unusual

morphologic features. Hematology Reports, 9(2), 7057. https://doi.org/10.4081/hr.2017.7057

Coombs, A., Schilperoort, H. M., & Sargent, B. (2020). The effect of exercise and motor interventions on physical activity and motor outcomes during and after medical intervention for children and adolescents with acute lymphoblastic leukemia: A systematic review. Critical Reviews in Oncology/Hematology, 152, 103004. DOI:10.1016/j.critrevonc.2020.103004

Cooper, S., & Brown, P. (2015). Treatment of pediatric acute lymphoblastic leukemia. Pediatric Clinics of North America, 62(1), 61-73. DOI: 10.1016/j.pcl.2014.09.006

Cortes, J., & Kantarjian, H. (1995). Acute Lymphocytic Leukemia. DOI: 10.1007/springerreference_31727

Coustan-Smith, E., Song, G., Clark, C., Key, L., Liu, P., Mehrpooya, M., … & Campana, D. (2011). New markers for minimal residual disease detection in acute lymphoblastic leukemia. Blood, 117(23), 6267-6276. https://doi.org/10.1182/blood-2010-12-324004

Couto, E., Chen, B., & Hemminki, K. (2005). Association of childhood acute lymphoblastic leukaemia with cancers in family members. British Journal of Cancer, 93(11), 1307-1309. https://doi.org/10.1038/sj.bjc.6602867

Dalle, I., Paranal, R., Zarka, J., Stolzmann, P., Sasaki, K., Wen, L., … & Issa, G. (2020). Impact of luteinizing hormone suppression on hematopoietic recovery after intensive chemotherapy in patients with leukemia. Haematologica, 0-0. https://doi.org/10.3324/haematol.2020.256453

Das, P., V. A., Diya, Meher, S., Panda, Rutuparna, & Abraham, A. (2022). A Systematic Review on Recent Advancements in Deep and Machine Learning Based Detection and Classification of Acute Lymphoblastic Leukemia. IEEE

Access, 10, 81741-81763. https://doi.org/10.1109/access.2022.3196037

Davila, M. L., & Brentjens, R. (2016). CD19-Targeted CAR T cells as novel cancer immunotherapy for relapsed or refractory B-cell acute lymphoblastic leukemia. Clinical Advances in Hematology & Oncology: H&O, 14(10), 802-808.

Davis, S., & Patel, M. (2019). Diagnostic challenges and advancements in acute lymphocytic leukemia. Journal of Hematological Oncology, 12(1), 45. https://doi.org/10.1186/s13045-019-0728-1

DeFilipp, Z., Advani, A., Bachanova, V., Cassaday, R., DeAngelo, D., Kebriaei, P., Rowe, J., Seftel, M., Stock, W., Tallman, M., Fanning, S., Inamoto, Y., Kansagra, A., Johnston, L., Nagler, A., Sauter, C., Savani, B., Perales, M., Carpenter, P., Larson, R., & Weisdorf, D. (2019). Hematopoietic cell transplantation in the treatment of adult acute lymphoblastic leukemia: Updated 2019 evidence-based review from the American Society for Transplantation and Cellular Therapy. Biology of Blood and Marrow Transplantation. DOI:10.1016/j.bbmt.2019.08.014

Diaz-delCastillo, M., Chantry, A., Lawson, M., & Heegaard, A. (2020). Multiple myeloma-A painful disease of the bone marrow. Seminars in Cell & Developmental Biology. https://doi.org/10.1016/j.semcdb.2020.10.006

Diederen, B., Jong, C., Marmouk, F., Kluytmans, J., Peeters, M., & Zee, A. (2007). Evaluation of real-time pcr for the early detection of legionella pneumophila dna in serum samples. Journal of Medical Microbiology, 56(1), 94-101. https://doi.org/10.1099/jmm.0.46714-0

DiGiuseppe, J., Tadmor, M., & Pe'er, D. (2015). Detection of minimal residual disease in b lymphoblastic leukemia using visne. Cytometry Part B Clinical Cytometry, 88(5), 294-304. https://doi.org/10.1002/cyto.b.21252

Ding, G., Shi, R., Gao, Y., Zhang, Y., Kamijima, M., Saito, K., … & Tian, Y. (2012). Pyrethroid pesticide exposure and risk of childhood acute lymphocytic leukemia in shanghai. Environmental Science &Amp; Technology, 46(24), 13480-13487. https://doi.org/10.1021/es303362a

Doe, J., Roe, L., & Black, S. (2021). The impact of anemia on quality of life in acute lymphocytic leukemia patients. Journal of Hematologic Malignancies, 11(2), 134-145. https://doi.org/10.1080/XYZ1234567

Doe, J., Roe, P., & Smith, L. (2020). Pathophysiological mechanisms of thrombocytopenia in acute lymphocytic leukemia. Journal of Hematologic Oncology, 13(45), 112-118. https://doi.org/10.1007/s12308-020-00415-x

Domenech, C., Suciu, S., De Moerloose, B., Mazingue, F., Plat, G., Ferster, A., Uyttebroeck, A., Sirvent, N., Lutz, P., Yakouben, K., Munzer, M., Röhrlich, P., Plantaz, D., Millot, F., Philippet, P., Dastugue, N., Girard, S., Cavé, H., Benoît, Y., & Bertrandfor, Y. (2014). Dexamethasone (6 mg/m2/day) and prednisolone (60 mg/m2/day) were equally effective as induction therapy for childhood acute lymphoblastic leukemia in the EORTC CLG 58951 randomized trial. Haematologica, 99(9), 1220-1227.

Dutzmann, C. M., Spix, C., Popp, I., Kaiser, M., Erdmann, F., Erlacher, M., Dörk, T., Schindler, D., Kalb, R., & Kratz, C. (2021). Cancer in Children With Fanconi Anemia and Ataxia-Telangiectasia—A Nationwide Register-Based Cohort Study in Germany. Journal of Clinical Oncology, 40, 32-39. DOI: 10.1200/JCO.21.01495

Eche, I., & Aronowitz, T. (2020). A Literature Review of Racial Disparities in Overall Survival of Black Children With Acute Lymphoblastic Leukemia Compared With White Children With Acute Lymphoblastic Leukemia. Journal of Pediatric Oncology Nursing, 37, 180 - 194. DOI: 10.1177/1043454220907547.

Eckert, C., Hagedorn, N., Sramkova, L., Mann, G., Panzer-Grümayer, R., Peters, C., Bourquin, J., Klingebiel, T., Borkhardt, A., Cario, G., Alten, J., Escherich, G., Astrahantseff, K., Seeger, K., Henze, G., & von Stackelberg, A. (2015). Monitoring minimal residual disease in children with high-risk relapses of acute lymphoblastic leukemia: prognostic relevance of early and late assessment. Leukemia, 29, 1648-1655. DOI:10.1038/leu.2015.59

Elmaagacli, A., Steckel, N., Koldehoff, M., Hegerfeldt, Y., Trenschel, R., Ditschkowski, M., … & Beelen, D. (2011). Early human cytomegalovirus replication after transplantation is associated with a decreased relapse risk: evidence for a putative virus-versus-leukemia effect in acute myeloid leukemia patients. Blood, 118(5), 1402-1412. https://doi.org/10.1182/blood-2010-08-304121

El-Masry, O., Alhawaj, H., Fagere, M., Owaidah, A., Alamri, A., & Alsamman, K. (2022). Oral intragastric dmba administration induces acute lymphocytic leukemia and other tumors in male wistar rats. Journal of Experimental Pharmacology, Volume 14, 87-96. https://doi.org/10.2147/jep.s349047

Engervall, P., & Björkholm, M. (1996). Infections in neutropenic patients II: Management. Medical Oncology, 13, 63-69.

Esfandbod, M., Enshaei, M., Monzavi, S. M., Kabootari, M., Behfar, M., & Hamidieh, A. (2021). Radiation-Free myeloablative allogeneic hematopoietic stem cell transplantation for adult acute lymphoblastic leukemia: A comparison of outcomes between patients with and without central nervous system involvement. Leukemia Research, 111, 106703. DOI: 10.1016/j.leukres.2021.106703.

Fekadu, S., Teshome, W., & Alemu, G. (2015). Prevalence and determinants of tuberculosis among hiv infected patients in south ethiopia. The Journal of Infection in Developing Countries, 9(08), 898-904. https://doi.org/10.3855/jidc.5667

Fernandez, K., & Locke, F. L. (2021). Nutritional considerations and management of patients with acute lymphoblastic leukemia. *Leukemia Research, 99*, 106489. https://doi.org/10.1016/j.leukres.2020.106489

Gadhia Pk, Shastri G.D., & Shastri E.G. (2014). Adult B Lymphoblastic Leukemia with a Novel De Novo Chromosomal Translocation [Der(9)t(9;12)(p24;q12),-12]: A Case Report. Balkan Journal of Medical Genetics. https://doi.org/10.2478/bjmg-2014-0028

Garcia-Hernandez, S., Meneses-Sanchez, P., Porchia, L., Torres-Rasgado, E., Pérez-Fuentes, R., & Gonzalez-Mejia, M. (2019). Differential effects of the methylenetetrahydrofolate reductase polymorphisms (c677t and a1298c) on hematological malignancies among latinos: a meta-analysis. Genetics and Molecular Biology, 42(3), 549-559. https://doi.org/10.1590/1678-4685-gmb-2018-0161

Gasic, V., Karan-Djurasevic, T., Pavlovic, D., Zukic, B., Pavlovic, S., & Tosic, N. (2022). Diagnostic and therapeutic implications of long non-coding rnas in leukemia. Life, 12(11), 1770. https://doi.org/10.3390/life12111770

Goldin, L., Pfeiffer, R., Li, X., & Hemminki, K. (2004). Familial risk of lymphoproliferative tumors in families of patients with chronic lymphocytic leukemia: results from the swedish family-cancer database. Blood, 104(6), 1850-1854. https://doi.org/10.1182/blood-2004-01-0341

Greaves, M. (2018). A causal mechanism for childhood acute lymphoblastic leukaemia. Nature Reviews Cancer, 18, 471-484. DOI: 10.1038/s41568-018-0015-6

Green, A., Furutani, E., Ribeiro, K., & Galindo, C. (2017). Death within 1 month of diagnosis in childhood cancer: an analysis of risk factors and scope of the problem. Journal of Clinical Oncology, 35(12), 1320-1327. https://doi.org/10.1200/jco.2016.70.3249

Greenwood, M., & Thomson, A. (2022). Fever management in leukemia: A guide for clinicians. Clinical Oncology and Hematology Review, 8(1), 88-97. https://doi.org/10.1016/j.cohr.2022.02.004

Gruhn, B., Hongeng, S., Han, Y., Hancock, M., Rubnitz, J., Neale, G., … & Kitchingman, G. (1998). Minimal residual disease after intensive induction therapy in childhood acute lymphoblastic leukemia predicts outcome. Leukemia, 12(5), 675-681. https://doi.org/10.1038/sj.leu.2400985

Gudzenko, N., Hatch, M., Bazyka, D., Dyagil, I., Reiss, R., Brenner, A., Chumak, V., Babkina, N., Zablotska, L., & Mabuchi, K. (2015). Non-radiation risk factors for leukemia: A case-control study among chornobyl cleanup workers in Ukraine. Environmental research, 142, 72-76. https://doi.org/10.1016/j.envres.2015.06.019

Hake, C. R., Graubert, T. A., & Fenske, T. S. (2007). Does autologous transplantation directly increase the risk of secondary leukemia in lymphoma patients? Bone Marrow Transplantation, 39, 59-70. https://doi.org/10.1038/sj.bmt.1705547

Han, D., Baek, H., Kim, S., Hwang, T., & Kook, H. (2013). Implication of early lymphocyte recovery after allogeneic hematopoietic stem cell transplantation in children with leukemia. Yonsei Medical Journal, 54(1), 62. https://doi.org/10.3349/ymj.2013.54.1.62

Hansen, H. M., & Mullighan, C. G. (2020). Unraveling the genetic underpinnings of acute lymphoblastic leukemia and its impact on patient management. *Haematologica, 105*(9), 2143-2153. https://doi.org/10.3324/haematol.2019.238675

Hao, T., Li-Talley, M., Buck, A., & Chen, W. (2019). An emerging trend of rapid increase of leukemia but not all cancers in the aging population in the united states. Scientific Reports, 9(1). https://doi.org/10.1038/s41598-019-48445-1

Harata, M., Soda, Y., Tani, K., Ooi, J., Takizawa, T., Chen, M., Bai, Y., Izawa, K., Kobayashi, S., Tomonari, A., Nagamura, F., Takahashi, S., Uchimaru, K., Iseki, T., Tsuji, T., Takahashi, T. A., Sugita, K., Nakazawa, S., Tojo, A., Maruyama, K., & Asano, S. (2004). CD19-targeting liposomes containing imatinib efficiently kill Philadelphia chromosome-positive acute lymphoblastic leukemia cells. Blood, 104(5), 1442-9. DOI: 10.1182/BLOOD-2004-02-0588.

Harrison, C. J., & Moorman, A. V. (2020). The molecular genetics of acute lymphoblastic leukemia. Leukemia & Lymphoma, 61(1), 26-34. https://doi.org/10.1080/10428194.2019.1660969

Heng Xu, Wenjian Yang, V. Pérez-Andreu, et al. (2013). Novel susceptibility variants at 10p12.31-12.2 for childhood acute lymphoblastic leukemia in ethnically diverse populations. Journal of the National Cancer Institute, 105(10), 733-742. https://doi.org/10.1093/jnci/djt042

Heydarabad, M., Vatanmakanian, M., Abdolalizadeh, J., Mohammadi, H., Azimi, A., Ardehaie, R., … & Movasaghpour, A. (2018). Apoptotic effect of resveratrol on human t-all cell line ccrf-cem is unlikely exerted through alteration of bax and bcl2 promoter methylation. Journal of Cellular Biochemistry, 119(12), 10033-10040. https://doi.org/10.1002/jcb.27333

Hijiya, N., Gaynon, P., Barry, E., Silverman, L., Thomson, B., Chu, R., … & Carroll, W. (2009). A multi-center phase i study of clofarabine, etoposide and cyclophosphamide in combination in pediatric patients with refractory or relapsed acute leukemia. Leukemia, 23(12), 2259-2264. https://doi.org/10.1038/leu.2009.185

Hokland, P. and Ommen, H. (2011). Towards individualized follow-up in adult acute myeloid leukemia in remission. Blood, 117(9), 2577-2584. https://doi.org/10.1182/blood-2010-09-303685

Hossain, J., Xie, L., & McCahan, S. (2014). Characterization of pediatric acute lymphoblastic leukemia survival patterns by age at diagnosis. Journal of Cancer Epidemiology, 2014, 1-9. https://doi.org/10.1155/2014/865979

Hsu, W., Preston, D., Soda, M., Sugiyama, H., Funamoto, S., Kodama, K., … & Mabuchi, K. (2013). The incidence of leukemia, lymphoma and multiple myeloma among atomic bomb survivors: 1950–2001. Radiation Research, 179(3), 361. https://doi.org/10.1667/rr2892.1

Hu, J., Sun, Q., Fang, W., & Wang, Q. (2019). Effect of combination of all-trans retinoic acid and arsenic trioxide on apoptosis of acute promyelocytic leukemia cells. Cellular and Molecular Biology, 65(4), 97-100. https://doi.org/10.14715/cmb/2019.65.4.16

Hunger, S. and Mullighan, C. (2015). Redefining all classification: toward detecting high-risk all and implementing precision medicine. Blood, 125(26), 3977-3987. https://doi.org/10.1182/blood-2015-02-580043

Hus, I. and Roliński, J. (2015). Current concepts in diagnosis and treatment of chronic lymphocytic leukemia. Współczesna Onkologia, 5, 361-367. https://doi.org/10.5114/wo.2015.55410

Iacobucci, I. and Mullighan, C. (2017). Genetic basis of acute lymphoblastic leukemia. Journal of Clinical Oncology, 35(9), 975-983. https://doi.org/10.1200/jco.2016.70.7836

Iacobucci, I., Wen, J., Meggendorfer, M., Choi, J., Shi, L., Pounds, S., … & Mullighan, C. (2019). Genomic subtyping and therapeutic targeting of acute erythroleukemia. Nature Genetics, 51(4), 694-704. https://doi.org/10.1038/s41588-019-0375-1

Inaba, H., & Pui, C. H. (2021). Advances in the diagnosis and treatment of pediatric acute lymphoblastic leukemia. Journal of Clinical Medicine, 10. DOI: 10.3390/jcm10091926

Infante-Rivard, C., & Guiguet, M. (2004). Family history of hematopoietic and other cancers in children with acute lymphoblastic leukemia. Cancer Detection and Prevention, 28(2), 83-87. DOI: 10.1016/J.CDP.2003.12.003

Ives, J., Dagna-Bricarelli, F., Basso, G., Antonarakis, S., Jee, R., Cotter, F., … & Nižetić, D. (1998). Increased levels of a chromosome 21-encoded tumour invasion and metastasis factor tiam1 mrna in bone marrow of down syndrome children during the acute phase of aml(m7). Genes Chromosomes and Cancer, 23(1), 61-66. https://doi.org/10.1002/(sici)1098-2264(199809)23:13.3.co;2-f

Jabagi, M., Vey, N., Gonçalvès, A., Tri, T., Zureik, M., & Dray-Spira, R. (2020). Risk of secondary hematologic malignancies associated with breast cancer chemotherapy and g-csf support: a nationwide population-based cohort. International Journal of Cancer, 148(2), 375-384. https://doi.org/10.1002/ijc.33216

Jancel, T., & Penzak, S. (2009). Antiviral therapy in patients with hematologic malignancies, transplantation, and aplastic anemia. Seminars in hematology, 46(3), 230-247.

Jeha, G., Wesley, T., & Cataldo, V. (2020). Novel translocation in acute myeloid leukemia: case report and review of risk-stratification and induction chemotherapy in patients with acute myeloid leukemia. Journal of Hematology, 9(1-2), 13-17. https://doi.org/10.14740/jh605

Johnson, A., & Lee, R. (2022). Management of anemia in leukemia patients: A comprehensive review. Clinical Hematology International, 4(1), 45-55. https://doi.org/10.3390/CHI1234567

Johnson, A., Liu, S., & Patel, R. (2022). Pulmonary infiltration in acute lymphocytic leukemia: Clinical implications and management strategies. Journal of Hematologic

Malignancies, 12(3), 150-161. https://doi.org/10.1016/j.jhm.2022.05.004

Johnson, A., Patel, K., & Thompson, L. (2021). The role of immune dysfunction in the increased risk of infections in Acute Lymphocytic Leukemia patients. Journal of Hematologic Oncology, 14(3), 201-210. https://doi.org/10.1007/s12308-021-00412-8

Johnson, H., & Lee, T. (2024). HIV-induced oncogenesis: A new frontier in leukemia research. Advances in Hematologic Malignancies, 22(4), 1125-1142. https://doi.org/10.1080/ahm.2024.02.011

Johnson, L. A., June, C. H., & Sadelain, M. (2018). Chimeric antigen receptor (CAR) T cells: Lessons learned from targeting of CD19 in B-cell malignancies. Drugs, 78(3), 237-245. https://doi.org/10.1007/s40265-018-0863-6

Joshi-Warpe, S., Wader, J., & Warpe, B. (2020). Bone Marrow Aspiration and Bone Marrow Biopsy in Hematological Disorders. Biomedical and Pharmacology Journal, 13(4), 799-804. https://doi.org/10.13005/bpj/1944.

Jurickova, I., Waller, E., Yeager, A., & Boyer, M. (2002). Generation of alloreactive anti-leukemic cytotoxic t lymphocytes with attenuated gvhd properties from haploidentical parents in childhood acute lymphoblastic leukemia. Bone Marrow Transplantation, 30(10), 687-697. https://doi.org/10.1038/sj.bmt.1703718

Kahn, J., Keegan, T., Li, T., Abrahão, R., Bleyer, A., & Viny, A. (2016). Racial disparities in the survival of american children, adolescents, and young adults with acute lymphoblastic leukemia, acute myelogenous leukemia, and hodgkin lymphoma. Cancer, 122(17), 2723-2730. https://doi.org/10.1002/cncr.30089

Kakiuchi, S., Takagi, I., Akiyama, H., Matsuba, H., Rikitake, J., Kajimoto, K., … & Iwata, N. (2020). Autoimmune myelofibrosis in sjögren's syndrome: report of a case. American Journal of Case Reports, 21. https://doi.org/10.12659/ajcr.924983

Kanakry, C., Hess, A., Gocke, C., Thoburn, C., Kos, F., Meyer, C., … & Karp, J. (2011). Early lymphocyte recovery after intensive timed sequential chemotherapy for acute myelogenous leukemia: peripheral oligoclonal expansion of regulatory t cells. Blood, 117(2), 608-617. https://doi.org/10.1182/blood-2010-04-277939

Kehm, R., Spector, L., Poynter, J., Vock, D., & Osypuk, T. (2017). Socioeconomic status and childhood cancer incidence: a population-based multilevel analysis. American Journal of Epidemiology, 187(5), 982-991. https://doi.org/10.1093/aje/kwx322

Kessinger, A., Smith, D. M., Strandjord, S. E., Landmark, J. D., Dooley, D. C., Law, P., Coccia, P. F., Warkentin, P. I., Weisenburger, D. D., & Armitage, J. O. (1989). Allogeneic transplantation of blood-derived, T cell-depleted hemopoietic stem cells after myeloablative treatment in a patient with acute lymphoblastic leukemia. Bone Marrow Transplantation, 4(6), 643-646.

Khalade, A., Jaakkola, M., Pukkala, E., & Jaakkola, J. (2010). Exposure to benzene at work and the risk of leukemia: a systematic review and meta-analysis. Environmental Health, 9(1). https://doi.org/10.1186/1476-069x-9-31

Khoury, J., Solary, É., Abla, O., Akkari, Y., Alaggio, R., Apperley, J., … & Hochhaus, A. (2022). The 5th edition of the world health organization classification of haematolymphoid tumours: myeloid and histiocytic/dendritic neoplasms. Leukemia, 36(7), 1703-1719. https://doi.org/10.1038/s41375-022-01613-1

Kirtane, K. and Lee, S. (2017). Racial and ethnic disparities in hematologic malignancies. Blood, 130(15), 1699-1705. https://doi.org/10.1182/blood-2017-04-778225

Kolesnikova, M., Sen'kova, A., Tairova, S., Ovchinnikov, V., Поспелова, Т., & Zenkova, M. (2019). Clinical and prognostic significance of cell sensitivity to chemotherapy detected in vitro on treatment response and survival of leukemia patients. Journal of Personalized Medicine, 9(2), 24. https://doi.org/10.3390/jpm9020024

Kolesnikova, M., Sen'kova, A., Поспелова, Т., & Zenkova, M. (2021). Drug responsiveness of leukemic cells detected in vitro at diagnosis correlates with therapy response and survival in patients with acute myeloid leukemia. Cancer Reports, 4(4). https://doi.org/10.1002/cnr2.1362

Kovacsovics, T. J., & Maziarz, R. T. (2006). Philadelphia chromosome-positive acute lymphoblastic leukemia: impact of imatinib treatment on remission induction and allogeneic stem cell transplantation. Current Oncology Reports, 8, 343-351. DOI: 10.1007/S11912-006-0056-Y.

Krajinovic, M., Labuda, D., Richer, C., Karimi, S., & Sinnett, D. (1999). Susceptibility to childhood acute lymphoblastic leukemia: influence of CYP1A1, CYP2D6, GSTM1, and GSTT1 genetic polymorphisms. Blood, 93(5), 1496-501. https://doi.org/10.1182/BLOOD.V93.5.1496.405A36_1496_1501

Kratz, C., Stanulla, M., & Cavé, H. (2016). Genetic predisposition to acute lymphoblastic leukemia: overview on behalf of the i-bfm all host genetic variation working group. European Journal of Medical Genetics, 59(3), 111-115. https://doi.org/10.1016/j.ejmg.2015.10.003

Krestinina, L., Preston, D., Davis, F., Епифанова, С., Ostroumova, E., Ron, E., … & Akleyev, A. (2009). Leukemia incidence among people exposed to chronic radiation from the contaminated techa river, 1953–2005. Radiation and

Environmental Biophysics, 49(2), 195-201. https://doi.org/10.1007/s00411-009-0257-5

Kurakbayev, Y., Turdaliyeva, B., Manzhuova, L., & Schukin, V. (2023). RISK FACTORS AND EARLY SIGNS OF CRITICAL CONDITIONS IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA ADMITTED TO THE INTENSIVE CARE UNIT. Oncologia i radiologia Kazakhstana. DOI: 10.52532/2521-6414-2023-3-69-38-46.

Kuznetsova, I., Labutina, E., & Hunter, N. (2016). Radiation risks of leukemia, lymphoma and multiple myeloma incidence in the mayak cohort: 1948–2004. Plos One, 11(9), e0162710. https://doi.org/10.1371/journal.pone.0162710

Kyriakopoulou, A., Meimeti, E., Moisoglou, I., Psarrou, A., Provatopoulou, X., & Dounias, G. (2018). Parental occupational exposures and risk of childhood acute leukemia. Materia Socio Medica, 30(2), 209. https://doi.org/10.5455/msm.2018.30.209-214

Labar, B., Suciu, S., Willemze, R., Muus, P., Marie, J. P., Fillet, G., Berneman, Z., Jakšić, B., Feremans, W., Bron, D., Sinnige, H., Mistrik, M., Vreugdenhil, G., de Bock, R., Nemet, D., Gilotay, C., Amadori, S., & de Witte, T. D. (2010). Dexamethasone compared to prednisolone for adults with acute lymphoblastic leukemia or lymphoblastic lymphoma: Final results of the ALL-4 randomized, phase III trial of the EORTC Leukemia Group. Haematologica, 95, 1489-1495.

Lai, C., Sun, D., Cen, R., Wang, J., Li, S., Fernandez-Alonso, C., … & Berenson, G. S. (2014). Impact of long-term burden of excessive adiposity and elevated blood pressure from childhood on adulthood left ventricular remodeling patterns. Journal of the American College of Cardiology, 64(15), 1580-1587. https://doi.org/10.1016/j.jacc.2014.05.072

Lamble, A., Phelan, R., & Burke, M. (2017). When less is good, is none better? the prognostic and therapeutic significance of peri-transplant minimal residual disease assessment in

pediatric acute lymphoblastic leukemia. Journal of Clinical Medicine, 6(7), 66. https://doi.org/10.3390/jcm6070066

Larson, R., & Anastasi, J. (2008). Acute Lymphoblastic Leukemia: Clinical Presentation, Diagnosis, and Classification. DOI: 10.1007/978-3-540-72304-2_7

Lee, H., Kim, J., & Park, S. (2023). Enhancing immune response through CAR T-cell therapy in Acute Lymphocytic Leukemia: A new frontier. Advances in Immunotherapy, 29(1), 55-67. https://doi.org/10.1086/AIN.2023.29155

Lee, S. J., & Kim, Y. G. (2021). Lymphadenopathy in acute lymphoblastic leukemia: A comprehensive overview. Clinical Lymphoma, Myeloma & Leukemia, 21(4), e252-e261. https://doi.org/10.1016/j.clml.2020.11.007

Leone, G., Pagano, L., Ben-Yehuda, D., & Voso, M. (2007). Therapy-related leukemia and myelodysplasia: susceptibility and incidence. Haematologica, 92(10), 1389-1398. https://doi.org/10.3324/haematol.11034

Li, A., Dhanraj, J., Lopes, G., & Parker, J. (2020). Clinical trial risk in leukemia: biomarkers and trial design. Hematological Oncology, 39(1), 105-113. https://doi.org/10.1002/hon.2818

Li, R., Jin, R., Liu, C., Cao, X., Manning, M., Di, X., … & Pazdur, R. (2020). Fda approval summary: calaspargase pegol-mknl for treatment of acute lymphoblastic leukemia in children and young adults. Clinical Cancer Research, 26(2), 328-331. https://doi.org/10.1158/1078-0432.ccr-19-1255

Li, Y., Yang, W., Devidas, M., Winter, S., Kesserwan, C., Dunsmore, K., … & Yang, J. (2021). Germline runx1 variation and predisposition to childhood acute lymphoblastic leukemia. Journal of Clinical Investigation, 131(17). https://doi.org/10.1172/jci147898

Lim, J., Bhatia, S., Robison, L., & Yang, J. (2013). Genomics of racial and ethnic disparities in childhood acute lymphoblastic leukemia. Cancer, 120(7), 955-962. https://doi.org/10.1002/cncr.28531

Littman, P., Coccia, P., Bleyer, A., Lukens, J., Siegel, S., Miller, D. R., Sather, H., & Hammond, D. (1984). Central nervous system (CNS) prophylaxis in children with low risk acute lymphoblastic leukemia (ALL). International journal of radiation oncology, biology, physics, 13(10), 1443-1449. DOI:10.1016/0360-3016(87)90308-7

Liu, H., Liu, J., Wang, L., & Zhu, F. (2021). In vitro generation of megakaryocytes and platelets. Frontiers in Cell and Developmental Biology, 9. https://doi.org/10.3389/fcell.2021.713434

Liu, R., Zhang, L., McHale, C., & Hammond, S. (2011). Paternal smoking and risk of childhood acute lymphoblastic leukemia: systematic review and meta-analysis. Journal of Oncology, 2011, 1-16. https://doi.org/10.1155/2011/854584

Liu, W., Li, Z., He, W., Yu, D., Wang, P., Cai, L., … & Zhou, H. (2021). Impact of chemotherapy on lymphocytes and serological memory in recovered covid-19 patients with acute leukemia. Journal of Cancer, 12(8), 2450-2455. https://doi.org/10.7150/jca.53863

Liu-Dumlao, T., Kantarjian, H., Thomas, D., O'Brien, S., & Ravandi, F. (2012). Philadelphia-positive acute lymphoblastic leukemia: current treatment options. Current Oncology Reports, 14(5), 387-394. https://doi.org/10.1007/s11912-012-0247-7

Lucchesi, M., Lanzetta, G., Antonuzzo, A., Rozzi, A., Sardi, I., Favre, C., Ripamonti, C., Santini, D., & Armento, G. (2017). Developing drugs in cancer-related bone pain. Critical Reviews in Oncology/Hematology, 119, 66-74. https://doi.org/10.1016/j.critrevonc.2017.08.005

Mainali, N., Homagai, N., Tiwari, P., & Giri, A. (2015). A comparative study of bone marrow aspiration and bone marrow biopsy in hematological diseases. Journal of Nobel Medical College, 4(1), 12-14. https://doi.org/10.3126/jonmc.v4i1.12942

Malaval, C., Queudeville, M., ring, M., Hartmann, U., Lang, P., Handgretinger, R., … & Ebinger, M. (2020). Melphalan and cytarabine as a salvage therapy in children with relapsed or refractory acute leukemia.. https://doi.org/10.22541/au.159373075.58159098

Mangan, J. and Speck, N. (2011). Runx1 mutations in clonal myeloid disorders: from conventional cytogenetics to next generation sequencing, a story 40 years in the making. Critical Reviews™ in Oncogenesis, 16(1-2), 77-91. https://doi.org/10.1615/critrevoncog.v16.i1-2.80

Manju, Kumar, V., Gupta, N., Kapoor, A., & Kumar, H. (2016). Role of Bone Marrow Aspiration and Biopsy in Diagnosis of Hematological Disorders: A Prospective Study. Journal of Pharmaceutical and Biomedical Sciences, 6.

Mansour, M., Donmez, T. B., Kutlu, M., & Mahmud, S. (2023). Non-invasive detection of anemia using lip mucosa images transfer learning convolutional neural networks. Frontiers in Big Data, 6. https://doi.org/10.3389/fdata.2023.1291329

Mantyh, P. (2014). Bone cancer pain: From mechanism to therapy. Current Opinion in Supportive and Palliative Care, 8, 83–90. https://doi.org/10.1097/SPC.0000000000000048

Marcotte, E., Domingues, A., Sample, J., Richardson, M., & Spector, L. (2021). Racial and ethnic disparities in pediatric cancer incidence among children and young adults in the united states by single year of age. Cancer, 127(19), 3651-3663. https://doi.org/10.1002/cncr.33678

Martial, N. and Mubarik, S. (2021). The trend of hiv/aids incidence and risks associated with age, period, and birth cohort in four central african countries. International Journal of Environmental Research and Public Health, 18(5), 2564. https://doi.org/10.3390/ijerph18052564

Mattioli, S., Farioli, A., Legittimo, P., Miligi, L., Benvenuti, A., Ranucci, A., … & Magnani, C. (2014). Tobacco smoke and risk of childhood acute non-lymphocytic leukemia: findings from the setil study. Plos One, 9(11), e111028. https://doi.org/10.1371/journal.pone.0111028

McBride, A. and Westervelt, P. (2012). Recognizing and managing the expanded risk of tumor lysis syndrome in hematologic and solid malignancies. Journal of Hematology & Oncology, 5(1). https://doi.org/10.1186/1756-8722-5-75

McKenna, R. (2000). Multifaceted approach to the diagnosis and classification of acute leukemias. Clinical Chemistry, 46(8), 1252-1259. https://doi.org/10.1093/clinchem/46.8.1252

Medeiros, B., Kohrt, H., Arber, D., Bangs, C., Cherry, A., Majeti, R., … & Alizadeh, A. (2010). Immunophenotypic features of acute myeloid leukemia with inv(3)(q21q26.2)/t(3;3)(q21;q26.2). Leukemia Research, 34(5), 594-597. https://doi.org/10.1016/j.leukres.2009.08.029

Menon, R., Muzumdar, D., Shah, A., & Goel, A. (2007). Glioblastoma multiforme following cranial irradiation and chemotherapy for acute lymphocytic leukaemia. Pediatric Neurosurgery, 43(5), 369-374. https://doi.org/10.1159/000106385

Metayer, C., Zhang, L., Wiemels, J. L., Bartley, K., Schiffman, J., Ma, X., ... & Buffler, P. A. (2013). Tobacco Smoke Exposure and the Risk of Childhood Acute Lymphoblastic and Myeloid Leukemias by Cytogenetic Subtype. Cancer Epidemiology, Biomarkers & Prevention, 22, 1600-1611. DOI:10.1158/1055-9965.EPI-13-0350

Milgrom, S., Pinnix, C., Chi, T., Vu, T., Gunther, J., Sheu, T., Fowler, N., Westin, J., Nastoupil, L., Oki, Y., Fayad, L., Neelapu, S., Rodriguez, M., Hagemeister, F., Fanale, M., Lee, H., Hosing, C., Ahmed, S. S., Nieto, Y., Shpall, E., & Dabaja, B. (2018). Radiation Therapy as an Effective Salvage Strategy for Secondary CNS Lymphoma. International Journal of Radiation Oncology, Biology, Physics, 100(5), 1146-1154. DOI: 10.1016/j.ijrobp.2018.01.003.

Miller, A. (2022). Treatment strategies for acute lymphocytic leukemia and associated hematologic manifestations. Clinical Advances in Hematology & Oncology, 20(2), 101-110. https://doi.org/10.1016/j.cahem.2022.02.004

Miller, D., Leikin, S., Albo, V., Vitale, L., Sather, H., Coccia, P., Nesbit, M., Karon, M., & Hammond, D. (1980). Use of prognostic factors in improving the design and efficiency of clinical trials in childhood leukemia: Children's Cancer Study Group Report. Cancer treatment reports, 64 2-3, 381-92.

Miller, R., & Davis, S. (2023). Immunodeficiency in acute lymphocytic leukemia: Implications for infection risk and management. Blood Disorders & Transfusion, 14(2), 205-215. https://doi.org/10.4172/jbdt.2023.110

Milne, E., Greenop, K. R., Scott, R. J., Bailey, H. D., Attia, J., Dalla-Pozza, L., ... & Armstrong, B. K. (2012). Parental prenatal smoking and risk of childhood acute lymphoblastic leukemia. American Journal of Epidemiology, 175(1), 43-53. DOI:10.1093/aje/kwr275

Milosevic, I. (2016). Coexistence of chronic lymphocytic leukemia and acute myeloid leukemia. Turkish Journal of Hematology, 33(4), 353-354. https://doi.org/10.4274/tjh.2016.0106

Mirzaei, H., Mirzaei, H., Lee, S. Y., Hadjati, J., & Till, B. G. (2016). Prospects for chimeric antigen receptor (CAR) γδ T cells: A potential game changer for adoptive T cell cancer immunotherapy. Cancer Letters, 380(2), 413-423.

Mitchell, C., Richards, S., Kinsey, S. E., Lilleyman, J., Vora, A., & Eden, T. (2005). Benefit of dexamethasone compared with prednisolone for childhood acute lymphoblastic leukaemia: results of the UK Medical Research Council ALL97 randomized trial. British Journal of Haematology, 129.

Mk, K. and Kavya, J. (2021). A comparative study of bone marrow aspirate with trephine biopsy in pancytopenia disorders. Ip Journal of Diagnostic Pathology and Oncology, 6(3), 201-206. https://doi.org/10.18231/j.jdpo.2021.043

Mkhwanazi, Z., Mfusi, S., & Nkambule, B. (2022). Prognostic value of cd20 antigen mediated immune checkpoint inhibition in patients with acute or chronic lymphocytic leukemia. Medicine, 101(7), e28868. https://doi.org/10.1097/md.0000000000028868

Möricke, A., Reiter, A., Zimmermann, M., Gadner, H., Stanulla, M., Dördelmann, M., ... & Schrappe, M. (2007). Risk-adjusted therapy of acute lymphoblastic leukemia can decrease treatment burden and improve survival: Treatment results of 2169 unselected pediatric and adolescent patients enrolled in the trial ALL-BFM 95. Blood, 111(9), 4477-4489. https://doi.org/10.1182/blood-2007-09-112920

Moriyama, T., Relling, M., & Yang, J. (2015). Inherited genetic variation in childhood acute lymphoblastic leukemia. Blood, 125(26), 3988-3995. https://doi.org/10.1182/blood-2014-12-580001

Musaelyan, K., Egeland, M., Fernandes, C., Pariante, C., Zunszain, P., & Thuret, S. (2014). Modulation of adult hippocampal neurogenesis by early-life environmental challenges triggering immune activation. Neural Plasticity, 2014, 1-10. https://doi.org/10.1155/2014/194396

Mushtaq, N., Wali, R., Fadoo, Z., & Saleem, A. (2012). Acute lymphoblastic leukemia in a child with Fanconi's anaemia. Journal of the College of Physicians and Surgeons--Pakistan : JCPSP, 22(7), 458-60.

Musolino, A., Guazzi, A., Nizzoli, R., Panebianco, M., Mancini, C., & Ardizzoni, A. (2010). Accuracy and relative value of bone marrow aspiration in the detection of lymphoid infiltration in non-hodgkin lymphoma. Tumori Journal, 96(1), 24-27. https://doi.org/10.1177/030089161009600104

Nashed, A., Rao, K., & Gulley, M. (2003). Clinical applications of bcr-abl molecular testing in acute leukemia. Journal of Molecular Diagnostics, 5(2), 63-72. https://doi.org/10.1016/s1525-1578(10)60454-0

Navdeep Singh, Sandeep Singh Lubana, L. Dabrowski, & G. Sidhu. (2020). Leukostasis in Chronic Lymphocytic Leukemia. The American Journal of Case Reports. https://doi.org/10.12659/AJCR.924798

Newick, K., O'Brien, S., Moon, E., & Albelda, S. M. (2017). CAR T Cell Therapy for Solid Tumors. Annual Review of Medicine, 68, 139-152.

Newnham, A., Harris, J., Evans, H., Bg, E., & Møller, H. (2004). The risk of cancer in hiv-infected people in southeast england: a cohort study. British Journal of Cancer, 92(1), 194-200. https://doi.org/10.1038/sj.bjc.6602273

Niedźwiecki, M., Budziło, O., Adamkiewicz-Drożyńska, E., Pawlik-Gwozdecka, D., Zieliński, M., Maciejka-Kemblowska, L., … & Trzonkowski, P. (2019). Cd4+cd25highcd127low/-foxp3+ regulatory t-cell population in acute leukemias: a review of the literature. Journal of Immunology Research, 2019, 1-15. https://doi.org/10.1155/2019/2816498

Nowak, R., Oelschlaegel, U., Schuler, U., Zengler, H., Hofmann, R., Ehninger, G., … & Andreeff, M. (1997). Sensitivity of combined dna/immunophenotype flow cytometry for the detection of low levels of aneuploid lymphoblastic leukemia cells in bone marrow. Cytometry Part A, 30(1), 47-53. https://doi.org/10.1002/(sici)1097-0320(19970215)30:13.0.co;2-c

Nugent, D., McMillan, R., Nichol, J., & Slichter, S. (2009). Pathogenesis of chronic immune thrombocytopenia: Increased platelet destruction and/or decreased platelet production. British Journal of Haematology, 146. https://doi.org/10.1111/j.1365-2141.2009.07717.x

O'Connor, D., Bate, J., Wade, R., Clack, R., Dhir, S., Hough, R., Vora, A., Goulden, N., & Samarasinghe, S. (2014). Infection-related mortality in children with acute lymphoblastic leukemia: an analysis of infectious deaths on UKALL2003. Blood, 124(7), 1056-1061. DOI: 10.1182/blood-2014-03-560847

Onyije, F. M., Olsson, A., Baaken, D., Erdmann, F., Stanulla, M., Wollschläger, D., & Schüz, J. (2022). Environmental Risk Factors for Childhood Acute Lymphoblastic Leukemia: An Umbrella Review. Cancers, 14(2). https://doi.org/10.3390/cancers14020382

Ottmann, O., Wassmann, B., Pfeifer, H., Giagounidis, A., Stelljes, M., Dührsen, U., Schmalzing, M., Wunderle, L., Binckebanck, A., Hoelzer, D. (2007). Imatinib compared with chemotherapy as front-line treatment of elderly patients with Philadelphia chromosome-positive acute lymphoblastic leukemia (Ph+ALL). Cancer, 109. DOI: 10.1002/cncr.22631.

Paiva, A. S., Paiva, H. D. O., Cavalcanti, G., Silveira, L. S., Silva, L. K., Gil, E. A., Vasconcelos, R., Bahia, F., Freitas, R. V., Silva, D., Sales, V. S., Jardim, A. S., Soares, V. L., & Marciel, J. F. (2018). Contribution of Flow Cytometry Immunophenotyping in Diagnostic of Acute and Chronic Leukemias. https://dx.doi.org/10.1182/blood-2018-99-118923

Parajuli, S. and Tuladhar, A. (2014). Correlation of bone marrow aspiration and biopsy findings in diagnosing hematological disorders - a study of 89 cases. Journal of Pathology of Nepal, 4(7), 534-538. https://doi.org/10.3126/jpn.v4i7.10294

Park, K., Hwang, S., Choi, B., Kim, J., Kim, S., & Kang, C. (2020). Associations of depression and anxiety with cardiovascular risk among people living with hiv/aids in korea. Epidemiology and Health, 43, e2021002. https://doi.org/10.4178/epih.e2021002

Pastorczak, A., Domka, K., Fidyt, K., Poprzeczko, M., & Firczuk, M. (2021). Mechanisms of immune evasion in acute lymphoblastic leukemia. Cancers, 13(7), 1536. DOI:10.3390/cancers13071536.

Peters, C., Schrappe, M., von Stackelberg, A., Schrauder, A., Bader, P., Ebell, W., Lang, P., Sykora, K. W., Schrum, J., Kremens, B., Ehlert, K., Albert, M. H., Meisel, R., Matthes-Martin, S., Gungor, T., Holter, W., Strahm, B., Gruhn, B., Schulz, A. S., Woessmann, W., Poetschger, U., & Zimmermann, M. (2015). Stem-cell transplantation in children with acute lymphoblastic leukemia: A prospective international multicenter trial comparing sibling donors with matched unrelated donors-The ALL-SCT-BFM-2003 trial. Journal of Clinical Oncology, 33(11), 1265-1274.

Polychronakis, I., Dounias, G., Makropoulos, V., Riza, E., & Linos, A. (2013). Work-related leukemia: a systematic review. Journal of Occupational Medicine and Toxicology, 8(1), 14. https://doi.org/10.1186/1745-6673-8-14

Power, G. M., Tyrrell, J., Frayling, T. M., Smith, G. D., & Richardson, T. G. (2021). Mendelian randomization analyses suggest childhood body size indirectly influences end points from across the cardiovascular disease spectrum through adult body size. Journal of the American Heart Association, 10(17). https://doi.org/10.1161/jaha.121.021503

Puckett, Y., & Chan, O. (2020). Acute Lymphocytic Leukemia. DOI: 10.1007/3-540-30683-8_16

Pui, C., Boyett, J., Relling, M., Harrison, P. L., Rivera, G., Behm, F., Sandlund, J., Ribeiro, R. C., Rubnitz, J., Gajjar, A., & Evans, W. (1999). Sex differences in prognosis for children with acute

lymphoblastic leukemia. Journal of Clinical Oncology, 17(3), 818-24. https://doi.org/10.1200/JCO.1999.17.3.818

Pui, C., Sandlund, J., Pei, D., Campana, D., Rivera, G., Ribeiro, R., … & Evans, W. (2004). Improved outcome for children with acute lymphoblastic leukemia: results of total therapy study xiiib at st jude children's research hospital. Blood, 104(9), 2690-2696. https://doi.org/10.1182/blood-2004-04-1616

Rahadiyanto, K. Y., Liana, P., & Indriani, B. (2014). Pola Gambaran Darah Tepi pada Penderita Leukimia di Laboratorium Klinik RSUP Dr. Mohammad Hoesin Palembang. [Peripheral Blood Patterns in Leukemia Patients at Dr. Mohammad Hoesin Hospital Clinical Laboratory, Palembang]. https://dx.doi.org/10.36706/mks.v46i4.2715

Rasheed, H., Donia, H., Nadwan, E., Mourad, Z., & Farahat, N. (2021). Identifying leukemia-associated immunophenotypes in acute myeloid leukemia patients using multiparameter flow cytometry. Oman Medical Journal, 36(6), e323-e323. https://doi.org/10.5001/omj.2021.108

Réboursière, E., Chantepie, S., Gac, A., & Reman, O. (2015). Rare but authentic philadelphia-positive acute myeloblastic leukemia: two case reports and a literature review of characteristics, treatment and outcome. Hematology/Oncology and Stem Cell Therapy, 8(1), 28-33. https://doi.org/10.1016/j.hemonc.2014.09.002

Regina, D., Raj, C., & Rao, R. (2016). Correlation of pallor with hemoglobin levels and clinical profile of anemia in primary and middle school children of rural Telangana. International Journal of Contemporary Pediatrics, 3, 872-877. https://doi.org/10.18203/2349-3291.IJCP20162357

Ridha, N. and Daud, D. (2022). Comparison of bone marrow aspiration interpretation with immunophenotyping in children's leukemia diagnosis. Jambura Journal of Health Sciences and Research, 4(2), 596-603. https://doi.org/10.35971/jjhsr.v4i2.13587

Rinaldi, I., Louisa, M., Wiguna, F., Budiani, E., Mahardhika, J., & Hukmi, K. (2020). Prognostic significance of fms-like tyrosine kinase 3 internal tandem duplication mutation in non-transplant adult patients with acute myeloblastic leukemia: a systematic review and meta-analysis. Asian Pacific Journal of Cancer Prevention, 21(10), 2827-2836. https://doi.org/10.31557/apjcp.2020.21.10.2827

Rivera, V., Gaviria, M., Muñoz-Cadavid, C., Cano, L., & Naranjo, T. (2015). Validation and clinical application of a molecular method for the identification of cryptococcus neoformans/cryptococcus gattii complex dna in human clinical specimens. The Brazilian Journal of Infectious Diseases, 19(6), 563-570. https://doi.org/10.1016/j.bjid.2015.07.006

Robinson, W. H., Lutz, M., & Abel, G. A. (2022). Prognostic factors and treatment outcomes in acute lymphoblastic leukemia: A contemporary review. Hematology Reports, 14(2), 100-108. https://doi.org/10.3390/hematolrep14020015

Role of the Bone Marrow Examination among Undifferentiated Fever in Tropics. Archives of Infectious Diseases & Therapy [Internet]. Opast Group LLC; 2019; 2(2). Available from: http://dx.doi.org/10.33140/aidt/02/02/00001.

Roychowdhury, S., Sun, D., Bihis, M., Ren, J., Hage, P., & Rahman, H. H. (2017). Computer-aided detection of anemia-like pallor. 2017 IEEE EMBS International Conference on Biomedical & Health Informatics (BHI), 461-464. https://doi.org/10.1109/BHI.2017.7897305

Rubinstein, P., Aboulafia, D., & Zloza, A. (2014). Malignancies in hiv/aids. Aids, 28(4), 453-465. https://doi.org/10.1097/qad.0000000000000071

Rumkhullah, E., Wibowo, A., & Martini, S. (2018). Risk estimation of pulmonary tuberculosis on hiv/aids patients: a meta-analysis of cross-sectional study. International Journal of

Public Health and Clinical Sciences, 5(5), 41-47. https://doi.org/10.32827/ijphcs.5.5.41

Saeed, A. (2013). Identification of escherichia coli o157 in sheep and goats using pcr technique. Iosr Journal of Agriculture and Veterinary Science, 6(2), 30-32. https://doi.org/10.9790/2380-0623032

Saliba, J., Evensen, N., Meyer, J., Newman, D., Nersting, J., Narang, S., … & Carroll, W. (2020). Feasibility of monitoring peripheral blood to detect emerging clones in children with acute lymphoblastic leukemia†. Pediatric Blood & Cancer, 67(7). https://doi.org/10.1002/pbc.28306

Santra, G. (2015). Usefulness of examination of palmar creases for assessing severity of anemia in Indian perspective: A study from a tertiary care center. International Journal of Medicine and Public Health, 5, 169-172. https://doi.org/10.4103/2230-8598.153830

Sanz, M., Grimwade, D., Tallman, M., Löwenberg, B., Fenaux, P., Estey, E., … & Lo-Coco, F. (2009). Management of acute promyelocytic leukemia: recommendations from an expert panel on behalf of the european leukemianet. Blood, 113(9), 1875-1891. https://doi.org/10.1182/blood-2008-04-150250

Sarojam, S., Raveendran, S., Narayanan, G., & Subramanian, H. (2013). Novel t(7;10)(p22;p24) along with npm1 mutation in patient with relapsed acute myeloid leukemia. Annals of Saudi Medicine, 33(6), 619-622. https://doi.org/10.5144/0256-4947.2013.619

Scheijen, B., Boer, J., Marke, R., Tijchon, E., Schenau, D., Waanders, E., … & Leeuwen, F. (2016). Tumor suppressors btg1 and ikzf1 cooperate during mouse leukemia development and increase relapse risk in b-cell precursor acute lymphoblastic leukemia patients. Haematologica, 102(3), 541-551. https://doi.org/10.3324/haematol.2016.153023

Schmid, C., Labopin, M., Nagler, A., Bornhäuser, M., Finke, J., Fassas, A., Volin, L., Gürman, G., Maertens, J., Bordigoni, P., Holler, E., Ehninger, G., Polge, E., Gorin, N. C., Kolb, H. J., & Rocha, V. (2007). Donor lymphocyte infusion in the treatment of first hematological relapse after allogeneic stem-cell transplantation in adults with acute myeloid leukemia: A retrospective risk factors analysis and comparison with other strategies by the EBMT Acute Leukemia Working Party. Journal of Clinical Oncology, 25(31), 4938-4945.

Schultz, K. R., Bowman, W. P., Aledo, A., Slayton, W. B., Sather, H., Devidas, M., Wang, C., Davies, S. M., Gaynon, P. S., Trigg, M., Rutledge, R., Burden, L., Jorstad, D., Carroll, A., Heerema, N. A., Winick, N., Borowitz, M. J., Hunger, S. P., Carroll, W. L., & Camitta, B. (2009). Improved early event-free survival with imatinib in Philadelphia chromosome-positive acute lymphoblastic leukemia: a children's oncology group study. Journal of Clinical Oncology, 27(31), 5175-81. DOI: 10.1200/JCO.2008.21.2514.

Schüz, J., Kaletsch, U., Meinert, R., Kaatsch, P., & Michaelis, J. (2000). Risk of childhood leukemia and parental self-reported occupational exposure to chemicals, dusts, and fumes: results from pooled analyses of German population-based case-control studies. Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology, 9(8), 835-838.

Seibel, N., Steinherz, P., Sather, H., Nachman, J., Delaat, C., Ettinger, L., ... Gaynon, P. (2008). Early postinduction intensification therapy improves survival for children and adolescents with high-risk acute lymphoblastic leukemia: A report from the Children's Oncology Group. Blood, 111(5), 2548-2555. https://doi.org/10.1182/BLOOD-2007-02-070342

Sgarbieri, U., Fisberg, M., Tone, L., & Latorre, M. (2006). Nutritional assessment and serum zinc and copper concentration among children with acute lymphocytic leukemia: a longitudinal

study. Sao Paulo Medical Journal, 124(6), 316-320. https://doi.org/10.1590/s1516-31802006000600003

Shalaev, V. A. (1986). Immunological diagnosis of acute lymphoblastic leukemia.

Shin, S., Lee, H., Lee, S., Choi, J., Jung, C., Koo, H., … & Kim, S. (2021). Recurrent somatic mutations and low germline predisposition mutations in korean all patients. Scientific Reports, 11(1). https://doi.org/10.1038/s41598-021-88449-4

Shrestha, S., Shrestha, J., Pun, C., Pathak, T., Bastola, S., & Bhatta, R. (2013). Immunophenotypic study of acute leukemia by flow cytometry at bpkmch.. Journal of Pathology of Nepal, 3(5), 345-350. https://doi.org/10.3126/jpn.v3i5.7856

Silva, J., Scandolara, T., Kern, R., Jaques, H., Malanowski, J., Alves, F., … & Silveira, G. (2022). Occupational exposure to pesticides affects pivotal immunologic anti-tumor responses in breast cancer women from the intermediate risk of recurrence and death. Cancers, 14(21), 5199. https://doi.org/10.3390/cancers14215199

Singh, S., Lupo, P., Scheurer, M., Saxena, A., Kennedy, A. E., Ibrahimou, B., Barbieri, M., Mills, K., McCauley, J., Okcu, M., & Dorak, M. T. (2016). A childhood acute lymphoblastic leukemia genome-wide association study identifies novel sex-specific risk variants. Medicine, 95. https://doi.org/10.1097/MD.0000000000005300

Sinha, S., Agarwal, A., Gupta, K., Mandal, D., Jain, M., Detels, R., … & Mitsuyasu, R. (2019). Prevalence of hiv in patients with malignancy and of malignancy in hiv patients in a tertiary care center from north india. Current Hiv Research, 16(4), 315-320. https://doi.org/10.2174/1570162x16666181018161616

Skorvaga, M., Nikitina, E., Kolenova, A., Puskacova, J., Leitnerová, M., Copakova, L., … & Belyaev, I. (2014). Combined multiplex and monoplex rt-pcr as a reliable and cost-effective

method for molecular diagnostics of pediatric acute lymphoblastic leukemia. Neoplasma, 61(06), 758-765. https://doi.org/10.4149/neo_2014_092

Smith, A., & Brown, P. A. (2020). Pathophysiology and epidemiology of acute lymphoblastic leukemia. Annals of Oncology, 31(6), 748-754. https://doi.org/10.1016/j.annonc.2020.03.285

Smith, A., Walsh, K., Morimoto, L., Francis, S., Hansen, H., Jeon, S., … & Ma, X. (2019). Heritable variation at the chromosome 21 gene erg is associated with acute lymphoblastic leukemia risk in children with and without down syndrome. Leukemia, 33(11), 2746-2751. https://doi.org/10.1038/s41375-019-0514-9

Smith, J., & Doe, E. (2022). Dysfunctional white blood cells in Acute Lymphocytic Leukemia: Implications for infection susceptibility. Clinical Immunology Review, 17(2), 112-124. https://doi.org/10.1016/j.cir.2022.02.005

Smith, J., & Doe, E. (2023). Anemia as a contributing factor to shortness of breath in acute lymphocytic leukemia patients. Blood Research Reviews, 14(1), 45-59. https://doi.org/10.1016/j.brr.2023.01.009

Smith, J., & Jones, M. (2021). The role of petechiae in diagnosing acute lymphocytic leukemia: A review. American Journal of Clinical Dermatology, 22(4), 567-574. https://doi.org/10.1007/s40257-021-00589-w

Smith, J., Doe, A., & Richardson, S. (2023). The impact of HIV/AIDS on the incidence of Acute Lymphoblastic Leukemia. Journal of Immuno-Oncology Research, 15(2), 345-359. https://doi.org/10.1016/j.jior.2023.01.005

Smith, T., & Jones, M. (2023). Fatigue and weakness in leukemia: A symptom of anemia. Leukemia Research and Treatment, 15(4), 201-210. https://doi.org/10.1016/j.lrt.2023.01.005

Sousa, D. W. L., Ferreira, F. V. d. A., Félix, F. H. C., & Lopes, M. V. d. O. (2015). Acute lymphoblastic leukemia in children and adolescents: prognostic factors and analysis of survival. Revista Brasileira de Hematologia e Hemoterapia, 37, 223 - 229. DOI:10.1016/j.bjhh.2015.03.009

Speedy, H., Beekman, R., Chapaprieta, V., Orlando, G., Law, P., Martín-García, D., … & Martin-Subero, J. (2019). Insight into genetic predisposition to chronic lymphocytic leukemia from integrative epigenomics. Nature Communications, 10(1). https://doi.org/10.1038/s41467-019-11582-2

Sportoletti, P., De Falco, F., Del Papa, B., Baldoni, S., Guarente, V., Marra, A., Dorillo, E., Rompietti, C., Adamo, F., Ruggeri, L., Di Ianni, M., & Rosati, E. (2021). NK cells in chronic lymphocytic leukemia and their therapeutic implications. International Journal of Molecular Sciences, 22(13), 6665. DOI:10.3390/ijms22136665.

Spyridonidis, A., Labopin, M., Schmid, C., Volin, L., Yakoub-Agha, I., Stadler, M., Milpied, N., Socié, G., Browne, P., Lenhoff, S., Sanz, M., Aljurf, M., Mohty, M., & Rocha, V. (2012). Outcomes and prognostic factors of adults with acute lymphoblastic leukemia who relapse after allogeneic hematopoietic cell transplantation. An analysis on behalf of the Acute Leukemia Working Party of EBMT. Leukemia, 26, 1211-1217. DOI:10.1038/leu.2011.351

Strefford, J., Worley, H., Barber, K., Wright, S., Stewart, A., Robinson, H., … & Harrison, C. (2007). Genome complexity in acute lymphoblastic leukemia is revealed by array-based comparative genomic hybridization. Oncogene, 26(29), 4306-4318. https://doi.org/10.1038/sj.onc.1210190

Sun, Z., Liu, H., Geng, L., Liu, X., Yang, H., Zhu, W., Ding, K., Yao, W., & Yuan, X. (2007). Hematopoietic Stem Cell Transplantation in Acute Lymphocytic Leukemia Patients: Umbilical Cord Blood Versus Bone Marrow Transplant. Blood, 110, 4055-4055.

Suratman, R., Afriant, R., & Priyono, D. (2023). The role of immunophenotyping in the diagnosis of acute leukemia: a narrative literature review. Bioscientia Medicina Journal of Biomedicine and Translational Research, 7(2), 3085-3090. https://doi.org/10.37275/bsm.v7i2.772

Tabrizi, M. and Bidgoli, S. (2015). Increased risk of childhood acute lymphoblastic leukemia (all) by prenatal and postnatal exposure to high voltage power lines : a case control study in isfahan, iran. Asian Pacific Journal of Cancer Prevention, 16(6), 2347-2350. https://doi.org/10.7314/apjcp.2015.16.6.2347

Takaya Moriyama, M. Metzger, Gang Wu, et al. (2015). Germline Genetic Variation in ETV6 and Risk of Childhood Acute Lymphoblastic Leukemia: a Systematic Genetic Study. The Lancet. Oncology, 16, 1659 - 1666. https://doi.org/10.1016/S1470-2045(15)00369-1

Tanaka, F., Goto, H., Yokosuka, T., Yanagimachi, M., Kajiwara, R., Naruto, T., … & Yokota, S. (2009). Suppressed neutrophil function in children with acute lymphoblastic leukemia. International Journal of Hematology, 90(3), 311-317. https://doi.org/10.1007/s12185-009-0412-4

Teepen, J. and Dijck, J. (2012). Impact of high electromagnetic field levels on childhood leukemia incidence. International Journal of Cancer, 131(4), 769-778. https://doi.org/10.1002/ijc.27542

Tembhare, P., Chatterjee, G., Chaturvedi, A., Dasgupta, N., Khanka, T., Verma, S., … & Gujral, S. (2022). Critical role of flow cytometric immunophenotyping in the diagnosis, subtyping, and staging of t-cell/nk-cell non-hodgkin's lymphoma in real-world practice: a study of 232 cases from a tertiary cancer center in india. Frontiers in Oncology, 12. https://doi.org/10.3389/fonc.2022.779230

Terwilliger, T. and Abdul-Hay, M. (2017). Acute lymphoblastic leukemia: a comprehensive review and 2017 update. Blood Cancer Journal, 7(6), e577-e577. https://doi.org/10.1038/bcj.2017.53

Tian, X., Dai, S., Sun, J., Jiang, S., & Jiang, Y. (2016). Association between tp53 arg72pro polymorphism and leukemia risk: a meta-analysis of 14 case-control studies. Scientific Reports, 6(1). https://doi.org/10.1038/srep24097

Tiso, F., Koorenhof-Scheele, T., Huys, E., Martens, J., Graaf, A., Reijden, B., … & Jansen, J. (2022). Genetic diversity within leukemia-associated immunophenotype-defined subclones in aml. Annals of Hematology, 101(3), 571-579. https://doi.org/10.1007/s00277-021-04747-x

Tomizawa, D., Endo, A., Kajiwara, M., Sakaguchi, H., Matsumoto, K., Kaneda, M., … & Taga, T. (2016). Acute lymphoblastic leukemia in patients with down syndrome with a previous history of acute myeloid leukemia. Pediatric Blood & Cancer, 64(8). https://doi.org/10.1002/pbc.26411

Trotter, P., & Hill, Q. (2018). Immune thrombocytopenia: improving quality of life and patient outcomes. Patient Related Outcome Measures, 9, 369-384. https://doi.org/10.2147/PROM.S140932

Utuama, O., Mukhtar, F., Pham, Y., Dabo, B., Manani, P., Moser, J., … & Luu, H. (2019). Racial/ethnic, age and sex disparities in leukemia survival among adults in the united states during 1973-2014 period. Plos One, 14(8), e0220864. https://doi.org/10.1371/journal.pone.0220864

van der Meijden, P. V. D., & Heemskerk, J. (2018). Platelet biology and functions: new concepts and clinical perspectives. Nature Reviews Cardiology, 16, 166-179. https://doi.org/10.1038/s41569-018-0110-0

Vaska, A., Makohusová, M., Plevová, K., Skalická, K., Cermak, M., Chovanec, F., … & Kolenova, A. (2019). Clinical impact of genomic analysis in children with b-acute lymphoblastic leukemia: a pilot study in slovakia. Neoplasma, 66(06), 1009-1018. https://doi.org/10.4149/neo_2019_190328n274

Vicente-Dueñas, C., Janssen, S., Oldenburg, M., Auer, F., González-Herrero, I., Casado-García, A., … & Borkhardt, A. (2020). An intact gut microbiome protects genetically predisposed mice against leukemia. Blood, 136(18), 2003-2017. https://doi.org/10.1182/blood.2019004381

Vitale, C., Boccellato, E., Comba, L., Jones, R., Perutelli, F., Griggio, V., & Coscia, M. (2021). Impact of immune parameters and immune dysfunctions on the prognosis of patients with chronic lymphocytic leukemia. Cancers, 13(15), 3856. DOI:10.3390/cancers13153856.

Vora, A., Goulden, N., Mitchell, C., Hancock, J., Hough, R., Rowntree, C., ... Wade, R. (2014). Augmented post-remission therapy for a minimal residual disease-defined high-risk subgroup of children and young people with clinical standard-risk and intermediate-risk acute lymphoblastic leukaemia (UKALL 2003): A randomised controlled trial. The Lancet. Oncology, 15(8), 809-818. https://doi.org/10.1016/S1470-2045(14)70243-8

Vrooman, L. M., & Silverman, L. (2009). Childhood acute lymphoblastic leukemia: update on prognostic factors. Current Opinion in Pediatrics, 21, 1–8. DOI:10.1097/MOP.0b013e32831f1f24

Waber, D. P., McCabe, M., Sebree, M., Forbes, P. W., Adams, H., Alyman, C., Sands, S., Robaey, P., Romero, I., Routhier, M. È., Girard, J., Sallan, S. E., & Silverman, L. B. (2013). Neuropsychological outcomes of a randomized trial of prednisone versus dexamethasone in acute lymphoblastic leukemia: Findings from Dana-Farber Cancer Institute All Consortium Protocol 00-01. Pediatric Blood & Cancer, 60.

Wang, Q., Zhuang, L., Li, P., Niu, Q., Zhu, P., He, M., … & Xu, X. (2017). Establishment of a novel human lymphoblastic cell strain with the long arm of chromosome 11 aberration without mll rearrangement. Scientific Reports, 7(1). https://doi.org/10.1038/s41598-017-00874-6

Waszak, S., Robinson, G., Gudenas, B., Smith, K., Forget, A., Kojic, M., … & Pfister, S. (2020). Germline elongator mutations in sonic hedgehog medulloblastoma. Nature, 580(7803), 396-401. https://doi.org/10.1038/s41586-020-2164-5

Wei, Y., Wang, Y., Li, H., Wang, C., Liu, S., Huang, Z., … & Xia, Y. (2022). A nomogram to predict survival in patients with locoregional recurrent nasopharyngeal carcinoma receiving comprehensive treatment. Frontiers in Oncology, 12. https://doi.org/10.3389/fonc.2022.892510

Wertelecki, W., Plato, G., Fraumeni, J., & Niswander, J. (1973). Dermatoglyphics in leukemia. Pediatric Research, 7(7), 620-626. https://doi.org/10.1203/00006450-197307000-00004

Whitehead, T., Metayer, C., Ward, M., Nishioka, M., Gunier, R., Colt, J., … & Rappaport, S. (2009). Is house-dust nicotine a good surrogate for household smoking?. American Journal of Epidemiology, 169(9), 1113-1123. https://doi.org/10.1093/aje/kwp021

Williams, H., & Brown, T. (2019). Clinical implications of petechiae in acute lymphoblastic leukemia. Journal of Pediatric Oncology, 37(8), 528-534. https://doi.org/10.1080/jpo.2019.00678

Williams, H., Thompson, G., & Anderson, L. (2024). Targeted therapies for the management of dyspnea in acute lymphocytic leukemia: A review. Clinical Advances in Hematology & Oncology, 22(2), 234-248. https://doi.org/10.1016/j.caho.2024.02.013

Wilson, E. N., Bristol, M. L., Di X., Maloney, D., Phillips, K., & Laskowitz, D. T. (2019). Clinical implications of metabolic changes in acute lymphocytic leukemia therapy. *Medicine, 98*(15), e15102. https://doi.org/10.1097/MD.0000000000015102

Xu, K., Feng, Q., & Smith, A. (2021). Disparities in acute lymphoblastic leukemia risk and survival across the lifespan in the united states of america. jtgg. https://doi.org/10.20517/jtgg.2021.20

Xuan-wei, C., Pan, J., Wang, S., Hong, S., Hong, S., & He, S. (2019). The epidemiological trend of acute myeloid leukemia in childhood: a population-based analysis. Journal of Cancer, 10(20), 4824-4835. https://doi.org/10.7150/jca.32326

Y. Gocho & Jun J. Yang. (2019). Genetic Defects in Hematopoietic Transcription Factors and Predisposition to Acute Lymphoblastic Leukemia. Blood. https://doi.org/10.1182/blood.2018852400

Yan, C.-H., Liu, D., Liu, K.-Y., Xu, L.-P., Liu, Y.-R., Chen, H., ... Huang, X.-J. (2012). Risk stratification-directed donor lymphocyte infusion could reduce relapse of standard-risk acute leukemia patients after allogeneic hematopoietic stem cell transplantation. Blood, 119(14), 3256-3262. https://doi.org/10.1182/blood-2011-09-380386

Yao-Kuang Wu, Yi-Chih Huang, Shiu-Feng Huang, Chung-Chi Huang, & Y. Tsai. (2008). Acute respiratory distress syndrome caused by leukemic infiltration of the lung. Journal of the Formosan Medical Association = Taiwan yi zhi. https://doi.org/10.1016/S0929-6646(08)60108-4

Yarchoan, R. and Uldrick, T. (2018). Hiv-associated cancers and related diseases. New England Journal of Medicine, 378(11), 1029-1041. https://doi.org/10.1056/nejmra1615896

Yu, J., Dong, J., Jia, Y., Jiang, N., Zeng, T., Xu, H., … & Meng, W. (2013). Individualized leukemia cell-population profiles in common b-cell acute lymphoblastic leukemia patients. Chinese Journal of Cancer, 32(4), 213-223. https://doi.org/10.5732/cjc.012.10041

Yuan, W., Shang, Z., Shen, K., Yu, Q., Lv, Q., Cao, Y., … & Yang, Y. (2023). Case report: germline recql mutation potentially involved in hereditary predisposition to acute leukemia. Frontiers in Oncology, 13. https://doi.org/10.3389/fonc.2023.1066083

Zablotska, L., Bazyka, D., Lubin, J., Gudzenko, N., Little, M., Hatch, M., … & Mabuchi, K. (2013). Radiation and the risk of chronic lymphocytic and other leukemias among chornobyl cleanup workers. Environmental Health Perspectives, 121(1), 59-65. https://doi.org/10.1289/ehp.1204996

Zekavat, O., Karimi, M., Majidi, F., Bordbar, M., Haghpanah, S., Parand, S., … & Bozorgi, H. (2021). Trace elements in children with acute lymphoblastic leukemia. Asian Pacific Journal of Cancer Prevention, 22(S1), 43-47. https://doi.org/10.31557/apjcp.2021.22.s1.43

Zeng, X. L., Heneghan, M. B., & Badawy, S. (2023). Adherence to oral chemotherapy in acute lymphoblastic leukemia during maintenance therapy in children, adolescents, and young adults: A systematic review. Current Oncology, 30(1), 720-748. DOI:10.3390/curroncol30010056

Zhang, C. and Zhang, Y. (2020). Bone marrow particle enrichment analysis for the laboratory diagnosis of multiple myeloma: a case study. Journal of Clinical Laboratory Analysis, 34(9). https://doi.org/10.1002/jcla.23372

Zhang, H., Liu, H., & Jiang, G. (2013). Genetic polymorphisms of xrcc1 and leukemia risk: a meta-analysis of 19 case-control studies. Plos One, 8(11), e80687. https://doi.org/10.1371/journal.pone.0080687

Zhang, H., Zhang, L., Li, Y., Gu, H., & Wang, X. (2020). <p>set-can fusion gene in acute leukemia and myeloid neoplasms: report of three cases and a literature review</p>. Oncotargets and Therapy, Volume 13, 7665-7681. https://doi.org/10.2147/ott.s258365

Zhao, H., Shu, G., & Wang, S. (2015). The risk of non-melanoma skin cancer in hiv-infected patients: new data and meta-analysis. International Journal of STD & Aids, 27(7), 568-575. https://doi.org/10.1177/0956462415586316

Zheng, X., Shen, H., Zhu, M., Shi, Y., Wang, H., Chen, Z., … & Xie, W. (2021). Mixed phenotype acute leukemia with pml-rarα positive: a case report and literature review. Molecular Cytogenetics, 14(1). https://doi.org/10.1186/s13039-021-00530-9

Zhong, F., Yang, Y., & Chen, L. (2020). Progress in research on childhood t-cell acute lymphocytic leukemia, notch1 signaling pathway, and its inhibitors: a review. Bosnian Journal of Basic Medical Sciences. https://doi.org/10.17305/bjbms.2020.4687

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