

# NURSING INTERVENTION IN THE MANAGEMENT OF LEUKAMIA IN CHILDREN

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# WHAT IS LEUKAEMIA

- Leukaemia can be defined as the cancer that originates in the bone marrow and affects haematopoiesis. (Fleming, 2012). It occurs as a result of abnormal multiplication (proliferation) of the white blood cells in the bone marrow which interferes with the normal cell production. The proliferation can spread to other organs like spleen, liver, meninges, lymph etc. (Smelter, Bare, Hinkle & Cheever, 2008).

# CLASSIFICATION

- Acute Lymphoblastic leukaemia(ALL). This is believed to be because of abnormal response to infection which is due to a change in the genes of the B-Cells precursor. (Abiri, Kelishadi, Sadeghi &Soleiman,2016).
- Chronic Lymphoblastic Leukaemia(CLL). This is classified as non-Hodgkin's lymphoma that affects the B-lymphocytes commonly occurring in the older adults which can go for years without requiring treatment. (Kyle,2017).
- Acute Myelogenous Leukaemia(AML). The risk of developing AML increases as on ages (Fleming,2012).
- Chronic Myelogenous Leukaemia(CML). This is diagnosed mostly at age 50-60years and it manifests with the same symptom as ALL (Flemings, 2012).

# IN CHILDREN.....

Childhood leukaemia is the commonest cancer in children under 15 years with annual incidence rate of 43 cases per million in the United States. (Charalambous & Vasileious.2012).

ALL is the commonest form of Leukaemia in children accounting for almost 30% of cases of all cancer (Bartram, Schrauder, Köhler & Schrappe, 2012). It accounts 80% of all leukaemia (Abiri et al 2016). The incidence of ALL is greater in Caucasian kids more than black kids and diagnosed more in male than in female with peak age incidence at 2-5 years (Abiri et al 2016).

According to Segel, Henly, Li, Pollack, Dync & White. 2017, The incidence of ALL in the United States between the year 2001-2014 were 34.0 cases per one million persons and was highest in Hispanics(42.9/million). In Germany, four in every 100,000 children is diagnosed with ALL every year. (Bartram, 2012).

In Finland, according to the Cancer Society of Finland, (2016) about 150 new cases of cancer are diagnosed every year in children and leukaemia is the most, about 50 children are diagnosed annually with leukaemia and they are mostly under 5 years and ALL is the most common form

# RISK FACTORS

The risk factor for leukaemia can either be genetical, infectious or environmental (Charalambous, 2012). One or more exposure to ionizing radiation before birth (first hit) and one or more ionizing exposure after birth can damage the haematopoietic stem cell and transform the pre-leukemic clones into leukaemia cells.

(Charalambous, 2012). According to Abiri et al (2016), The following have been identified as the possible risk factor; Ionizing radiation, parental smoking, pesticides, household chemical, traffic fumes, immunological modifiers, lower expression of interleukin-10, nutrition (diet of the mother and the child). Vusani et al (2017), stated that none of these factors can be associated with leukaemia.

The prognosis of leukaemia in children has increased over the years with advancement of technology. In Finland today, almost 90% of children with cancer are well 5 years from diagnosis (cancer society of Finland, 2016). In the United States, the five years survival rate of children with ALL under 5 years is 89% and in Iran is 72.5% and 58.0% for ALL and AML respectively. (Veisani et al 2016).

# NURSING INTERVENTION

Nursing intervention includes the use of nursing process approach for the total care of the child with leukaemia. American Nurses Association standard of clinical Nursing Practice (1998). in Smeltzer et al (2008), stated that Nursing process is a deliberate problem-solving approach for meeting people's healthcare and nursing needs and it includes – Assessment, Diagnosis, Planning, Implementation and Evaluation.

Since the parent of the child diagnosed with leukaemia is the first and most important caregiver of the child, they are faced with different problems such as understanding the symptoms, drugs, side effects, financial, family and social problem, they also go through a lot of psychological problems e.g. depression, anxiety, stress etc. (Noughabi, Iranpoor, Yousefi, Abrakht & Dehkordi 2014). The nurse therefore has the role of health education and helping parents to go through the process without much stress. Nursing intervention involves the role of the nurse from the diagnosis of leukaemia through the disease process, discharge and follow up

# ROUTINE LIFE MANAGEMENT

- Nutritional Requirement and Care plan: According to research done by (Ronald D. Barr et al. 2016) undernutrition results in reduced tolerance of chemotherapy, alterations in drug metabolism, reduced immunity, increased risk of infection and compromised quality of life during treatments, although the quality of the evidence supporting each of these effects is variable. In 1989 Lobato-Mendizabal and colleagues in Puebla reported that undernourished children, defined by body weight, had much poorer 5-year disease-free survival (26%) than well-nourished children (83%) with standard risk diseases and showed that the former had lower cumulative doses of maintenance chemotherapy and experienced more relapses than the well-nourished patients.

From the research article (Ronald D. Barr et al. 2016) Children who is undergoing active treatment for Leukaemia requires nutritional supplementation. There is a strong preference for using the gut either by mouth or with tube feeding. Innovative approaches for which there is some evidence of benefit, particularly in children with leukaemia, include supplementation with omega-3-fatty acids such as eicosapentaenoic acid. Appetite stimulation, such as with megestrol acetate or cyproheptadine, is not used widely in children.

The challenge of providing nutritional supplementation to child with cancer has resulted in some solutions. In Mexico, fortified chocolate bars containing 200 kcal have been used as snacks, whereas in Brazil it was found that homemade nutritional formulas were economical, well accepted by children and adolescents with cancer and had adequate nutritional composition. Natural resources have been put to good use in Malawi in the form of 'chiponde', a peanut based ready-to-use therapeutic food (RUTF). A comparable experience in Guatemala involves 'incaparina', an RUTF based on a mixture of commercialized maize and soy flours. In India, there are numerous locally produced RUTFs

- Potential Physical Therapy(PT): - Potential physical therapy (PT) interventions for children with ALL included exercises to improve LE muscle strength and range of motion(ROM), functional activities to improve muscle endurance and aerobic capacity, and other weight bearing activities to improve bone mineral density (Marchese et al. 2008). Marchese et al. (2004) indicated that incorporating a PT intervention for patients with ALL was effective to improve LE strength and ankle dorsiflexion during the maintenance phase of chemotherapy.

The 6-minute walk test (6MWT) was performed by (Paula Vercher et al. Feb 19, 2016) during the case study with 3 years old male child. The test is a sub-maximal exercise test that can be used to assess functional exercise (walking) capacity and endurance (Hartman et al., 2013).

- Symptoms Management Strategy: - The study done by (Suthisa Temtap, Kittikorn Nilmanat. August 9 2011) have provided important information on symptoms experience and management for children with AML in Thailand. The results focus in the development of clinical care for patients with AML.

They have also included that psychological symptoms such as worry, fear, discouragement, and boredom should also not be ignored. According to the author (Suthisa and Kittikorn) healthcare providers, particularly nurses require training to enhance the quality of their care through comprehensive symptom assessment and effective symptom management. Furthermore, health-care providers may find a symptom experience scale useful for identifying and monitoring symptoms experienced by patients with AML during chemotherapy and deciding on appropriate strategies to alleviate them. Below is the chart that the health care provider should know while assessing children situation

- Coping Strategies for Leukemic Children: - Coping involves cognitive and/or behavioural attempts to manage (reduce or tolerate) stressful situations (Aldridge and Roesch, 2007). Coping is a process that can either improve or block adaptation and quality of life and can also affect overall adjustment to illness (Patenaude and Kupst, 2005).

A qualitative study using face to face interview by Jing Han, Jun-E. Liu, Qian Xiao with school aged children(n=29) was done to explore their coping strategies for the treatment. The results clarified that participant made effort to receive social support by communicating with trusted people about low moods (e.g., nurses, parents, good friend). It was found that other children preferred to act to change their low moods by controlling themselves until emotional improvements occurred naturally. Some of the participant has also declared that writing in a diary, reading a book, watching TV, thinking, and distracting attention) and passive emotional regulation (selective forgetfulness, going to sleep has been their self-control strategies. Two of 29 participant has shared that they acted to express emotions for example by crying, playing games or doodling in a paper. Also, few of the participant has shared parent's encouragement has made their self-esteem . All the participant on the study wanted an encouragement, explanation and reassurance from nurses and doctor for psychological adjustment.

- Information provision; According to Aburu & Gott, 2014, it is important to educate parents of children diagnosed with ALL to enable them recognise early life threatening symptoms like fever. The diagnosis of cancer can alter the family relationship as attention is focused on entirely on the sick child leaving other siblings unattended to. Information should be provided before treatment paying attention to the family's state of emotion, their grieving process and understanding their fear for the strange environment (hospital) and strange illness (leukaemia). (Aburn et al, 2014).

In their study, a semi-structured interview method was used, and the population were parents/caregivers of children diagnosed with ALL between February 1, 2009 and February 28, 2009. 12 parents/caregivers were studied, they all stated that psychological impacts of the diagnosis makes it difficult to learn about the disease, also whereas many parents identified their lack of knowledge of the disease at the time of diagnosis, others stated that discussing with health professional about the disease during the initial stage of diagnosis allays their fears and anxiety and always makes it possible for them to be able to understand the disease process and treatment(Aburn et all, 2014). .

Also, many parents stated that consistency in the nurse's care was very helpful during the process. Most parents also stated that interacting with parents of children with similar diagnosis also with nurses in the clinic were helpful to them psychologically. (Aburn et all, 2014).

- Care during chemotherapy

As chemotherapy is basically the main treatment of leukaemia, it's potential side effect and complication should be considered, and appropriate care given during the course of use. (Tiware, Kantawang, Wonghongul & Lerwatthanawilat ,2016). In their study to find out the predicting factors of uncertainty of illness in children undergoing chemotherapy, a cross sectional predictive design was used, the sample size 96 children and 96 parents, a questionnaire was used to collect data, the main predicting factors found were, symptom pattern, information support from healthcare provider, illness- related knowledge and parental uncertainties. Those with information support from healthcare providers maintained a high level of wellbeing.

This is in congruent with the previous studies which stated that information provision is very crucial in the leukaemia treatment. Symptom pattern was another predicting factor, those who perceived symptom as been consistent in frequency, intensity and duration there is low uncertainty, these are children who had been on chemotherapy for a longer period whereas those with recent cancer diagnosis (1-4 years) have high level of uncertainty. Also, an increase in illness-related knowledge means a decrease in uncertainty. Parental uncertainty is another factor, as parent's uncertainty increases, the child's uncertainty also increases. These results are in congruent with that of ( Aburn & Gott, 2014). Which explains that discussion with the health care professional about the disease during the initial stage of diagnosis helped them to understand the disease and treatment well.

# CONCLUSSION

- Leukaemia has a long period of treatment regimen and each stage of treatment requires some responsibility from the nurse, therefore the nurse should be able to integrate proper nursing care during each stage of treatment.
- Information provision is crucial in the management process therefore a well-structured and detailed information should always be provided to both the child and parent/care giver paying attention to their emotional stage.
- Further nursing research should be carried out to identify the role of the nurse in the management of other types of cancer as there are few materials regarding nursing roles in the oncology field.

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