

THE ROLE OF NUTRITION IN CHEMOTHERAPY IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKAEMIA

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ABSTRACT: Nutrition is an important part of cancer treatment. Eating the right kinds of foods during and after treatment can help the patient feel better and stay stronger. Malnutrition is one of the major problems in children with cancer. Severe weight loss and abnormally low concentrations of certain plasma proteins such as albumin and transferrin have been recognized for a long time in patients with cancer, including children. An observational study was conducted among 50 children affected with ALL undergoing chemotherapy at oncology department of 3 multispecialty hospitals of Hyderabad.

AIM & OBJECTIVE: The aim of this study is to determine the Role of nutrition in children with Acute Lymphoblastic Leukemia undergoing Chemotherapy and to study the effect of chemotherapy on biochemical parameters of patient with acute lymphoblastic leukemia.

METHODOLOGY:

An observational study was conducted among 50 children between the ages 01-12 years diagnosed with ALL (Acute lymphoblastic leukemia) undergoing treatment at oncology dept. of 3 multispecialty hospital in Hyderabad. Various factors such as Age, socio economic status, diet preference, Weight changes during chemotherapy, side effects of chemotherapy, Dietary pattern, Biochemical parameters before and after chemotherapy were studied for which a structured case study format was used.

RESULTS:

From this study it was concluded that 70% of the children were malnourished upon receiving chemotherapy there was weight gain in 30% of them and 20% had lost weight. Also there was a significant effect of chemotherapy on the biochemical parameters of children. It was seen that there was a decrease in the WBC level in 64% of them and also decrease in HB level in 44% of the children. It was also observed that the children who ate well showed considerable amount of weight gain and improvement in the biochemical parameters. Hence nutrition does play an important role in treatment of children with ALL

Key words: Acute Lymphoblastic Leukemia, children, nutrition, malnutrition

INTRODUCTION:

Acute lymphoblastic leukemia (ALL) is a type of cancer that affects the blood and bone marrow. ALL is characterized by an overproduction of immature white blood cells, called lymphoblast or leukemic blasts. Because the bone marrow is unable to make adequate numbers of red blood cells, normal white cells and platelets. People with ALL become more susceptible to anemia, recurrent infections, and to bruising and bleeding easily. The blast cells can then spill out of the bone marrow into the bloodstream and accumulate in various organs including the lymph nodes (glands), spleen, liver and central nervous system (brain and spinal cord).(1)

Causes of ALL (Acute lymphoblastic leukemia): The exact causes of ALL remain largely unknown but it is thought to result from mutations in one or more of the genes that normally control blood cell development. This mutation will result in abnormal growth.

Research is going on all the time into possible causes of this damage, and certain factors have been identified that may put some people at an increased risk. These include exposure to very high doses of radiation either accidentally (nuclear accident) or therapeutically (to treat other cancers)

Industrial chemicals like benzene, pesticides, and certain types of chemotherapy used to treat other cancers. Certain types of viral infections and the way in which the immune system reacts may play a role in the development of some types of ALL. People with certain genetic disorders like Down's syndrome and Fanconi's anemia may have a higher than average risk of developing ALL.(2)

ALL (Acute lymphoblastic leukemia) is the most common type of cancer in children.

In a healthy child, the bone marrow makes blood stem cells (immature cells) that become mature blood cells over time. A blood stem cell may become a myeloid stem cell or a lymphoid stem cell.(3)

MATERIAL & METHOD:An observational study was conducted among 50 children between the ages 10-12 years diagnosed with ALL (Acute lymphoblastic leukemia) undergoing treatment at oncology dept. of 3 multispecialty hospitals in Hyderabad.

An institutional case study format was designed to record the anthropometric measurements and also the biochemical parameters like Haemoglobin, Red blood cells, White blood cells, Platelets level before and after chemotherapy. Dietary pattern and preferences were also studied. Changes in weight were and their acceptance towards food was recorded.

RESULTS AND DISCUSSION:People with ALL[Acute Lymphoblastic Leukemia] become more susceptible to anaemia, recurrent infections and bleeding easily.

The current study found that there was 60% of boys and 40% of girls. Upon the analysis of data among 50 children 70% of the children were malnourished. The malnutrition is having much impact on ALL[Acute Lymphoblastic leukemia] in developing countries. The major nutrition indicators are weight for age and serum albumin.

There was weight gain in 30% of them and 20% had lost weight. Among 50 children 36% of them were of middle class and 64% of them were of low income group which inturn effect the nutritional status. The side effect of chemotherapy on children there was 24% of children was effected with fever and 24% of patient with vomiting and 52% of patient did not show any side effect. Since specific antioxidants have shown to be depleted as a consequence of therapy.

Also there was a significant effect of chemotherapy on the biochemical parameters of children. Haemoglobin levels may have a better prognosis than predicted by the WBC[white blood cell] count. It was seen that there was a decrease in WBC level in 64% and also decrease in HB level in 44% of the children respectively.

Hence these are some Dietary Guideline

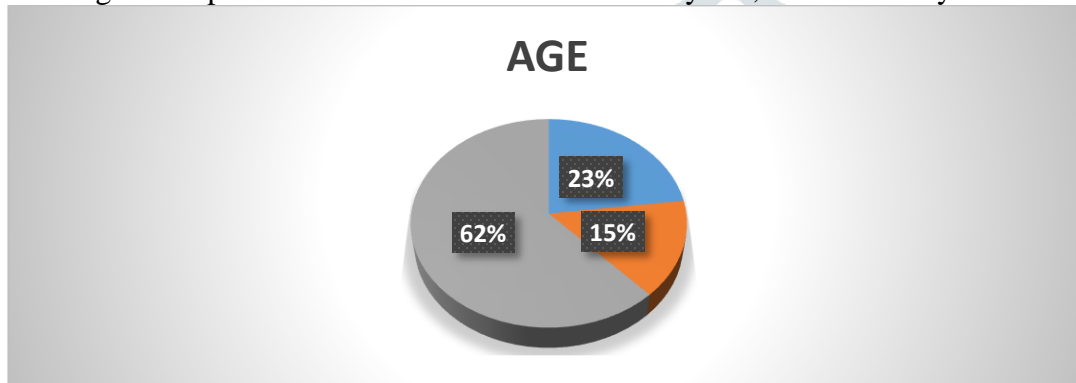
1. Children whose Biochemical parameters are affected by Chemotherapy should consume a Balanced Diet.
2. A diet rich in Iron should be consumed.
3. Avoid fast foods.
4. Maintain meal timings.
5. it's preferable to eat small meals at frequent intervals to enhance absorption and digestion.

6. To maintain weight, a Balanced Diet with Good quality Proteins, Folic acid, Vitamin B12 and Vitamin-C should be taken.
7. Chicken, fish weekly twice and 3 egg whites per day is recommended. Green leafy vegetables which are good source of Folic acid should be included.
8. Do not combined an Iron rich meal with too many Calcium rich foods. Take it an hour before or after the meal
9. Eat Vitamin-C- rich food at the same time that when iron rich food is consumed.
10. Avoid tea and coffee with meals.

RESULTS:

1) Age

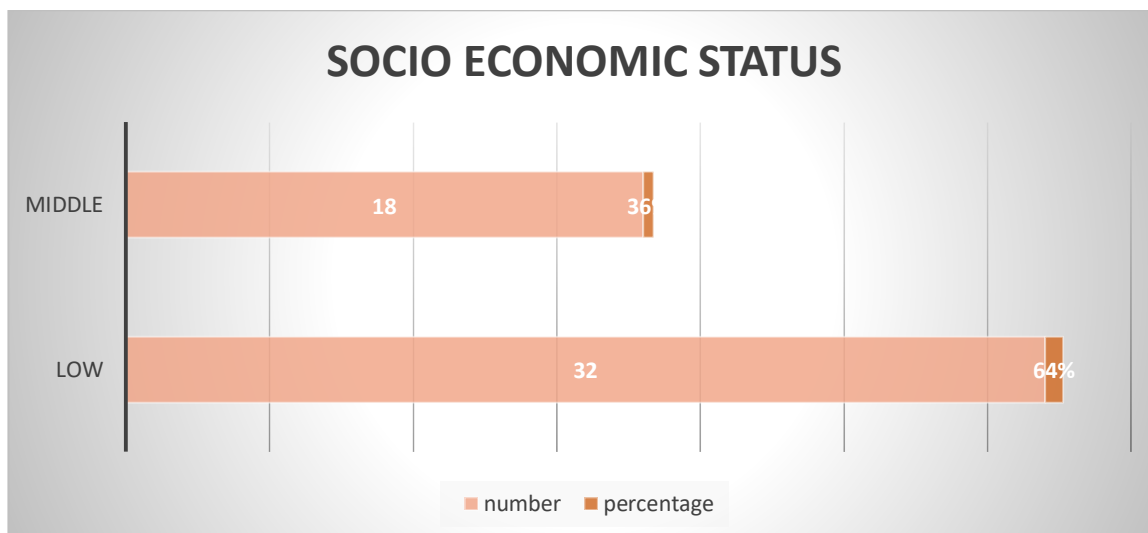
Among the 50 patients 52% of children were of 1-5 years, 34% of 6-10 years and 14% were of 10-20 years.



2) Socio Economic status

Upon analysis of data among 50 children, 36% of them were of middle class and 64% of them were of low income group.

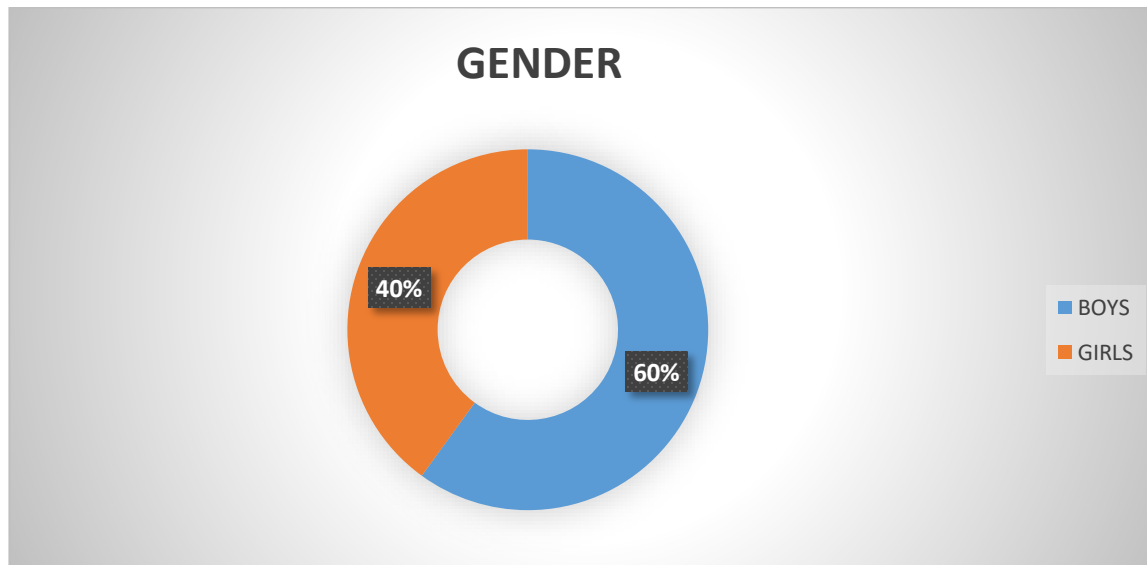
Status	Number (no=50)	Percentage
Low	32	64%
Middle	18	36%



3) Gender:

Among the 50 patients were 30 boys and 20 girls.

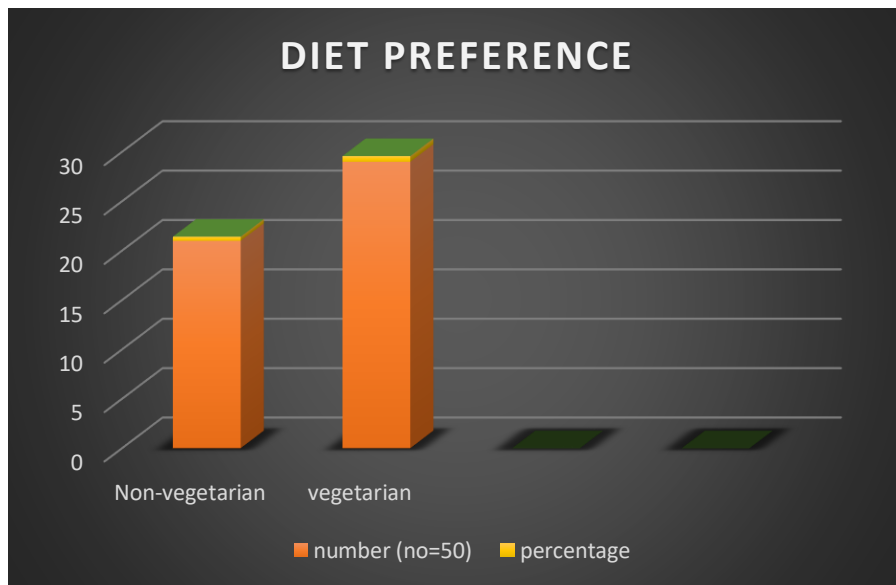
GENDER	NUMBER (no=50)	PERCENTAGE
BOYS	30	60%
GIRLS	20	40%



4) Diet preference

Children were grouped into two groups based on their preference of diet. It was seen that 42% of children were non-vegetarian and 58% of children were vegetarian.

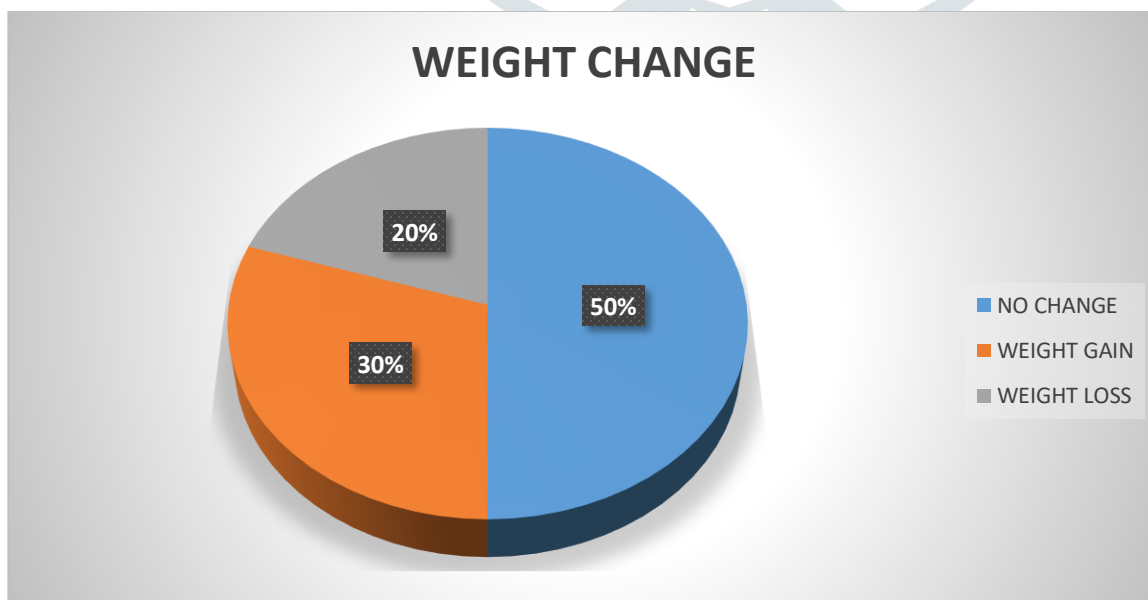
Diet preference	Number (no=50)	Percentage
Non-vegetarian	21	42%
Vegetarian	29	58%



5) Weight Changes during chemotherapy

Upon analysis of data, it was seen that 50% of them had no weight changes, 30% of them gained weight and 20% of them lost weight during chemotherapy.

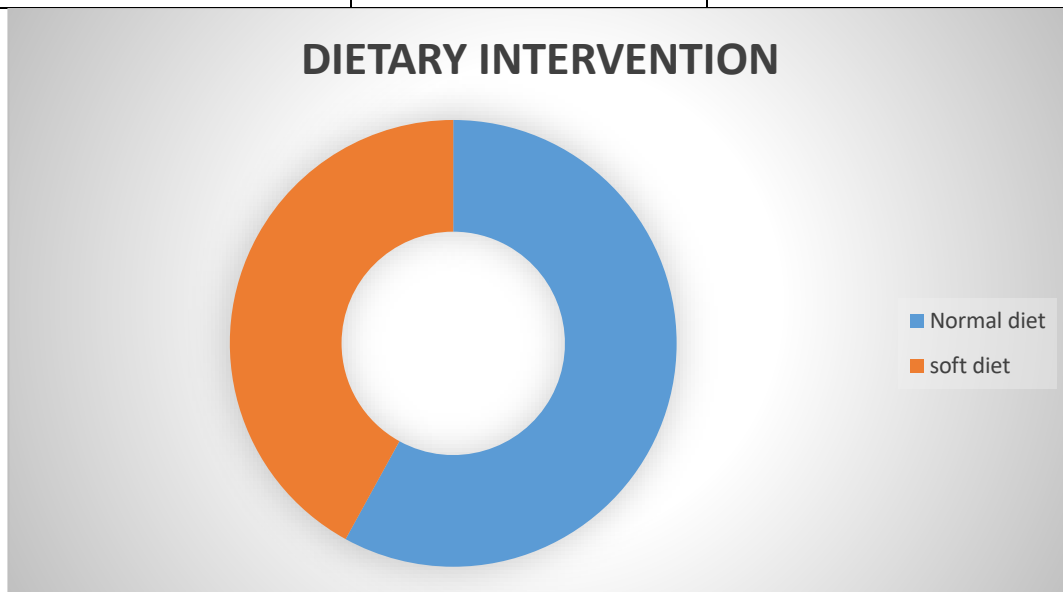
Weight change during chemotherapy	Number (no=50)	Percentage
No weight change	25	50%
weight Gain	15	30%
weight Loss	10	20%



6) Dietary intervention

Upon analysis of data, it was seen that among 50 respondents 58% were on normal diet and 42% were on soft diet.

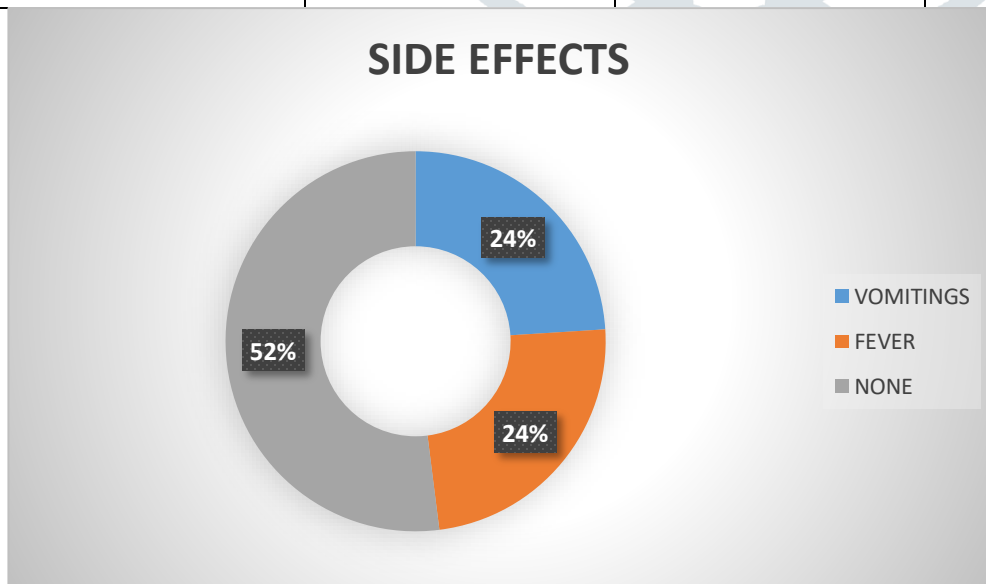
Diet	Number (no=50)	Percentage
Normal diet	29	58%
Soft diet	21	42%



7) Side Effects

The table below illustrates that 24% had vomiting's, 24% had fever and 52% did not show any side effect.

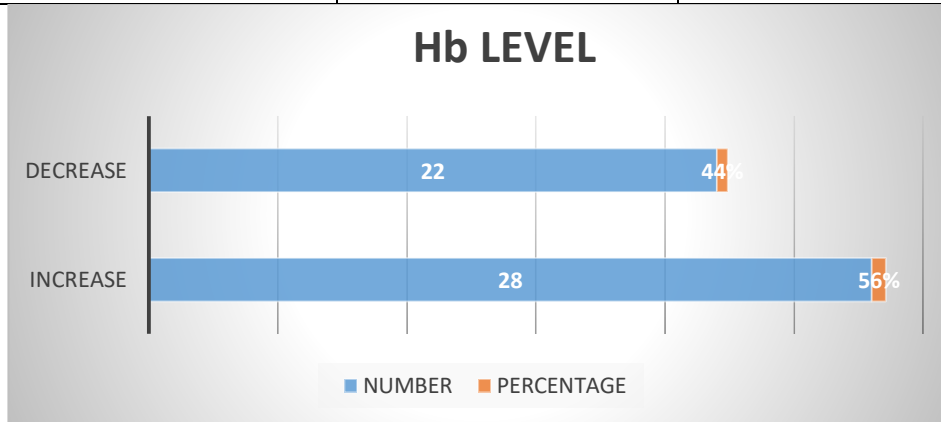
Side effect	Number (no=50)	Percentage
Vomiting's	12	24%
Fever	12	24%
None	26	52%



8) HAEMOGLOBIN LEVEL

56% of the children showed increase in the Haemoglobin levels after chemotherapy and 44% showed decrease in haemoglobin level.

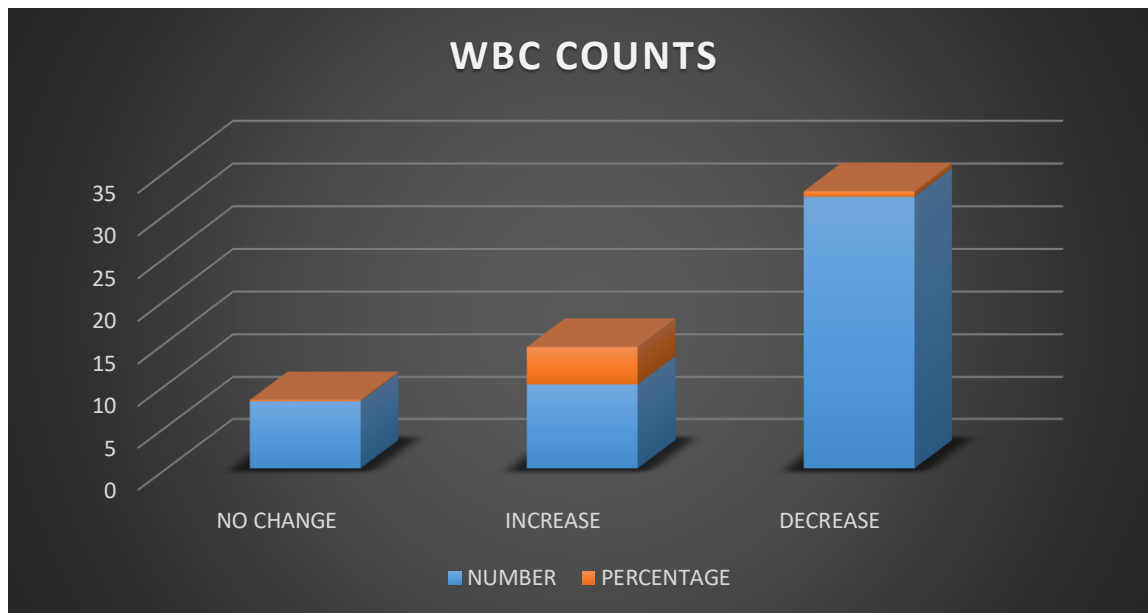
Hb level	Number (no=50)	Percentage
Increase	28	56%
Decrease	22	44%



9) WBC Level

There was no change in WBC count in 16% of them, whereas 20% of them had increased WBC count and in 64% of them the WBC count decreased during chemotherapy.

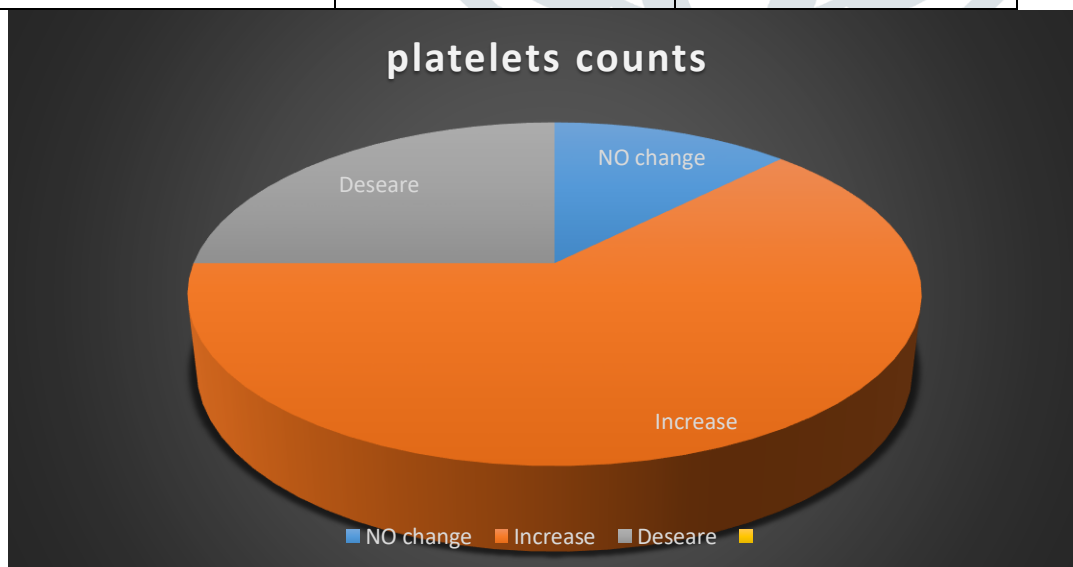
WBC LEVEL	Number (no=50)	Percentage
No change	8	16%
Increase	10	20%
Decrease	32	64%



8) Platelets count

It was seen that 10% of them had no change in platelet count, in 50% of them the platelets level increased and in 20% the platelets level decreased.

Platelets counts	Number (no=50)	Percentage
No change	5	10%
Increase	25	50%
Decrease	10	20%



CONCLUSION

Acute Lymphoblastic Leukemia [ALL] is a type of cancer that affects the blood and bone marrow because the bone marrow is unable to make adequate numbers of red blood cells, normal white cells and platelets. From this study we can conclude that 70% of the children were malnourished upon receiving chemotherapy. The effect of chemotherapy of patient with Acute Lymphoblastic Leukemia. Malnutrition is having much impact on prognosis of ALL [Acute Lymphoblastic Leukemia] in developing countries. The dietary intake data at the time of cancer diagnosis is a multicenter setting in pediatric population at high risk for nutrition related morbidity. Like Anemia is the most frequently observed haematological abnormalities faced by cancer patients. Children survival of ALL [Acute Lymphoblastic Leukemia] in developing countries could improve if problems that are associated with parental financial and medical teams attitude to treatment and follow up could be addressed better.

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