SUMMARY

Over the past 50 years, survival rates for most childhood cancer have increased dramatically. Acute lymphoblastic leukemia (ALL) the most common form of cancer in children provides a striking example of such progress. Today survival rates approaching 80% are experienced**.** These successes have shifted attention to two important issues: the morbidity burden during the process of treatment and the long effects of the disease and its treatment on the health status and health-related quality of life of survivors.

Researchers are examining neurocognitive sequelae of these agents to understand the specific role of chemotherapy in neurocognitive changes and the mechanism through which these occur

Our study aimed to examine neurocognitive late effects after chemotherapy in survivors of ALL.

This study was held over the period from December 2009 to November 2010 at National Cancer Institute, Pediatric Oncology Unit-Zagazige University Hospital and Benha Children Hospital on 50 children and adolescents in long-term remission from ALL, treated with chemotherapy only protocol, at least one year from the end of the therapy, without relapse and no prediagnosis history of neurodevelopmental disorders. Survivors were classified into 2 groups:

Group (1): 25 patients received modified CCG protocols with low dose methotrexate.

Group (2): 25 patients received T13 protocol with high dose methotrexate.

This study groups were compared with 20 healthy siblings matched for gender and age on measures of intellectual functioning Wechsler Intelligence Scale for Children-Third Edition (WISC-III).

In our study, there is significant decrease of full scale Wechsler IQ score in leukemic group than control group, also young age of onset of chemotherapy appears to be more risky for developing cognitive dysfunction as there is significant difference in comparison patients whose age of onset of the disease below than those above 5 years old in Wechsler performance IQ scores (except in picture completion & mazes, there is no significant difference), at the same time there is no significant difference in Wechsler verbal IQ scores.

Sex plays an important risk factor for deterioration of neurocognitive function in survivors of ALL treated with chemotherapy alone as there is significant differences in both verbal and performance IQ scores between girls and boys, with girls do worse than boys in all IQ parameters except in vocabulary and picture arrangement subtests.

We found a relationship between treatment intensity and neurocognitive outcome, as we evaluated neurocognitive function in survivors of ALL treated with chemotherapy with two different protocols and our study hypothesized that there is highly significant decline in all IQ parameters (total, verbal and performance) in patients treated with high dose methotrexate.

Our results indicated negative correlation between both care-giver education, care-giver occupation and IQ parameters of ALL survivors.

CONCLUSION AND RECOMMENDATIONS

In conclusion, this study revealed that chemotherapy alone appears to have subtle effects on specific neurocognitive functions, most commonly including attention, visual processing and visual-motor functioning which are more prominent in children who are younger at diagnosis, in girls versus in boys and with high treatment intensity.

Prospective follow-up of such patients and early neuropsychological rehabilitation of those with cognitive deficits are essential to further improve their chances for successful academic and professional careers.

Cognitive sequelae after childhood ALL treated with chemotherapy only must be taken into account by schools and health care providers. Reduced IQ is a well-known risk factor for mental health problems, psychosocial dysfunction and school problems. Intervention programs must be constructed for long-term follow up to limit the secondary effects of lower IQ. ALL survivors should be taught strategies to compensate for their deficits.