INTRODUCTION: L-Asparaginase induced hyperglycemia is a rare and transient cause of secondary diabetes mellitus in children. Reported incidence of ketoacidosis is not frequent and recurrence of hyperglycemia with repetitive doses of L-Asparaginase is 10%. The most widely accepted mechanism of hyperglycemia is a reversible decrease in insulin synthesis of beta cells. We investigated the frequency, clinical, and laboratory findings of L-asparaginase induced hyperglycemia among children with acute lymphoblastic leukemia treated with L-asparaginase, prednisone, vincristine and daunorubicin for remission-induction in three years period.

DESCRIPTION OF CASES: Three children (4.8%) complicated by nonketotic and two (3.2%) children complicated by ketotic hyperglycemia (maximum plasma glucose levels 503.4 +/- 141.7 mg/dl) in the 17.8 +/- 10.2 days of remission-induction therapy. Family history was positive for type 2 diabetes mellitus in three children. Polyuria and polydipsia were not the common symptoms of all patients, especially two children with ketoacidosis had no specific symptoms of diabetes. Hyperglycemia was resolved 8.4 +/- 6.4 days of insulin (0.72 +/- 0.28 U/kg) treatment and recurred in three of the patients. We detected elevated levels of glycated hemoglobin (9.86 +/- 2.26 %), hypoinsulinemia (2.2 +/- 0.52 microIU/ml), and low levels of C-peptide (0.09 +/- 0.024 micromol/l) in hyperglycemic period. Hypoinsulinemia was more prominent in three children with recurrent hyperglycemia. However, none of the children had clinical or laboratory signs of glucose intolerance three months after the resolution of hyperglycemia.

DISCUSSION: As from five patients with L-asparaginase induced hyperglycemia, two of them developed ketoacidosis, we want to emphasize the importance of monitoring the urine and serum glucose levels in remission induction therapy. We found the recurrence incidence of hyperglycemia higher than literature. Also as three children with recurrent hyperglycemia had more prominent hypoinsulinemia, we think that serum insulin level may serve as an indicator of probable recurrent hyperglycemia.