Duration of Adrenal Insufficiency During Treatment for Childhood Acute Lymphoblastic Leukemia

Children with acute lymphoblastic leukemia (ALL) receive high doses of glucocorticosteroid as part of their treatment. This may lead to suppression of the hypothalamic-pituitary-adrenal axis, acute adrenal insufficiency, and ultimately to life-threatening conditions. This study explores the adrenal function in 96 children with ALL treated according to common protocols. After cessation of induction glucocorticosteroid therapy, they received hydrocortisone substitution therapy (10 mg/m²/24 h) until an adrenocorticotropic hormone test (250 μg tetracosactide) showed a sufficient adrenal response \[ \text{plasma (p)-cortisol} \geq 500 \text{ nM} \]. At the first adrenocorticotropic hormone test, 67% of the patients had adrenal insufficiency. When including these patients in a multivariate model, not adjusting for risk factors, the mean elapsed time between end of induction therapy and adrenal sufficiency was 8.5 months (95% confidence interval: 6.3; 10.7). Low 0-minute p-cortisol (\( P = 0.02 \)) and low rise in p-cortisol (\( P < 0.0001 \)) at first test caused a longer time of adrenal insufficiency. In addition, patients with B-cell precursor leukemia reached adrenal sufficiency later than those with T-cell leukemia (\( P = 0.067 \)). As adrenal insufficiency is frequent in children treated for ALL and as they often experience infections and other stressors, the adrenal response should be determined and hydrocortisone substitution therapy should be considered during such episodes in patients with adrenal insufficiency.