Evaluation of Lactate Dehydrogenase Tumor Marker in Children with Gonadal Germ Cell Tumor, Epithelial Tumor, Sex Stromal Tumor, Paragonadal Tumor, and Cyst

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To the Editor: Ovarian and testicular tumors, especially germ cell tumors (GCT), rarely occur in children [1]. Gonadal tumors present with broad symptoms, causing delayed diagnosis in $\geq 70\%$ of patients and poorer outcomes [2]. Discovering the appropriate tumor marker for detecting and managing cancer patients is essential. Our 5-y (2015–2020) study analyzed the effectiveness of lactate dehydrogenase (LDH), an enzyme [3], in 96 children with cysts, and nonmalignant and malignant (para)gonadal tumors at our hospital, using normal LDH level of 0–300 u/L.

Most patients presented at ages > 12 –15, stage 2, and patient-to-tumor size peaked at > 5 –10 cm. Seventy-five out of 96 patients had elevated LDH, 52 being GCT. Sixty-eight out of 96 patients had malignant tumors; of which, 67 patients had LDH > 300 u/L. The sensitivity, specificity, and area-under-curve values were 98.5%, 71.4%, and 0.850, respectively. The p value was 0.001.

Ten out of 12 patients with recurrence and 32/32 patients with metastasis had LDH > 300 u/L. LDH normalized in 59/75 patients between after-the-operation and 6-mo period, and in 12/75 patients after 6 mo. However, LDH remained elevated in 4/75 patients with rhabdomyosarcoma - 767 u/L; dysgerminoma - 2185 u/L (highest LDH value in our study); mixed GCT - 704 u/L and 1210 u/L, till they died. The value of LDH for the largest tumor size of 28 cm was 394 u/L. Eight patients without malignancy, who had 5–26 cm tumor sizes, compressed organs, both gonads affected, torsion or chronic diseases, had LDH > 300 u/L.

The LDH median values were as follows: 251.5 u/L - patients without malignancy; 327.0 u/L - stage 1; 432 u/L - stage 2; 771.5 u/L - stage 3; and 1210.0 u/L - stage 4. The p value was 0.031 showing a positive correlation with tumor stage. Considering that stage 3, the onset of late-stage cancer critical for prognosis [4], fell in the 700 u/L range, we re-analyzed all patients using LDH - 700 u/L; 24/24 patients with LDH > 700 u/L had malignancy. Nineteen out of 21 patients admitted with metastasis; 15/16 patients with elevated LDH level after 6 mo, 23/27 patients at stages 3–4; 18/28 patients with poor prognosis; and 4/4 patients who died, all had LDH > 700 u/L.

Declarations

Conflict of Interest None.

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