Background: Gonadal dysfunction is one of the major endocrinological late effects among childhood cancer survivors (CCS). Measurements of anti-Müllerian hormone (AMH) concentration are useful as markers of ovarian reserves in female CCS.

Objective: To investigate variations in serum AMH levels to determine the acute and chronic effects of cancer therapy.

Method: A prospective study in three female patients with hematological diseases.

Results: 

- **Case 1**: Patient with myelodysplastic syndrome. Received chemotherapy and reduced intensity stem cell transplantation (SCT) at 10 yr old. AMH (ng/mL): 1.48 (pre) → 0.10 (1-month post-SCT) → 0.9 (12 mo) → 0.34 (15 mo) → <0.1 (18 mo). Breast development and spontaneous menarche were noted. 

- **Case 2**: Patient with acute lymphocytic leukemia. Chemotherapy: 11 yr old. AMH: 1.85 (pre) → <0.10 (0 mo post-tx) → 1.46 (3 mo) → 0.6 (6–18 mo) → 1.24 (24 mo) → 1.55 (30 mo). Menstruation continued regularly.

- **Case 3**: Patient with acute myelogenous leukemia. Cancer therapy: 13 yr old.

Conclusion: Different patterns of AMH during the recovery phase supported the significance of longitudinal studies. The optimal timing for measuring AMH levels is not just after the end of cancer therapy for CCS.

We conducted a prospective, longitudinal study before and after different cancer therapies from January 2012. The ethical committee of Osaka University Hospital approved this study. Written informed consent for evaluation was obtained from the parents of the patients.

The medical records of three female patients with hematological diseases were reviewed. Patients were questioned regarding age at the time of breast development and details regarding menstruation.

We measured basal plasma concentrations of follicle-stimulating hormone (FSH), luteinizing hormone (LH), and estradiol (E2). The concentrations of AMH were measured using highly sensitive ELISA assays (AMH Gen II) (AMH Gen II (ng/mL) = 0.189 × EIA AMH/MIS (pmol/L) -0.334 × SRL). We did not perform trans-vaginal ultrasonograms to measure ovary antral follicle count because of the young age of the patients or because consent was not obtained.

Among 53 female CCS, 28 (53%) had decreased AMH levels, while only 16 (30%) had increased FSH levels.

References:

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