Question: 42
A 16-year-old girl is being seen in your clinic because of headaches for the past month that sometimes awaken her at night. At her last visit 2 years ago, she was well, 5 ft 2 in tall, and weighed 105 lb, with Sexual Maturity Rating (SMR) 4 breast development and SMR 4 pubic hair, but she had not reached menarche. On examination at this visit, she is 5 ft 2 in tall, weighs 110 lb, and still has not begun menstruating. On evaluation, you note bitemporal visual field deficits, perhaps worse on the left.

In addition to magnetic resonance imaging and an ophthalmologic evaluation, the laboratory test that is MOST likely to be most diagnostically revealing is

A. adrenocorticotropic hormone
B. insulin-like growth factor-1
C. luteinizing hormone
D. prolactin
E. thyroid-stimulating hormone
The 16-year-old girl described in the vignette has had arrest of pubertal development with failure of menarche for at least 2 years. The bitemporal visual field deficits imply the presence of a large suprasellar mass. The two most common causes for such a mass lesion are pituitary macroadenomas and craniopharyngiomas, and the most common macroadenoma is a prolactinoma. Elevations of prolactin values could be due to increased prolactin secretion from a prolactinoma or to compression of the pituitary stalk by another pituitary tumor, a craniopharyngioma, or other space-occupying lesion. Because stalk compression interferes with the dopaminergic inhibitory influences on pituitary release of prolactin, prolactin concentrations of up to 200 mcg/L may be due solely to stalk compression. Prolactin concentrations in that range interfere with normal menstrual cycling and suppress normal puberty. A large tumor also might interfere with pubertal and other pituitary hormones because of its mass. Accordingly, measuring prolactin will be most helpful in determining whether the girl has a prolactinoma. Prolactinomas usually respond to treatment with medication such as cabergoline; surgery rarely is required.

Elevated adrenocorticotropic hormone (ACTH) values might be seen in Cushing disease, but the girl in the vignette exhibits no signs or symptoms of Cushing disease, such as weight gain, skin striae, hypertension, cushingoid facies, and muscle weakness. Further, the pituitary tumors in affected individuals rarely are macroadenomas because the symptoms lead to an earlier diagnosis. A low concentration of insulin-like growth factor-1 might suggest growth hormone deficiency, and a high concentration suggests acromegaly. No signs or symptoms of acromegaly, such as rapid growth, coarsening of facial features, sweating, or thickening of skin, are described for the girl. Measurement of thyroid-stimulating hormone (TSH) might identify a TSH-producing tumor or severe hypothyroidism that is primary because of thyroid gland failure. A TSH-producing tumor, which is very rare, produces hyperthyroidism, and no symptoms of hyperthyroidism are described for the girl in the vignette. Sometimes severe primary hypothyroidism can lead to the development of an enlarged pituitary composed of thyrotropes (TSH-secreting cells), but no symptoms or signs of severe hypothyroidism (eg, pallor, lethargy, dry skin, coarse facies, slow heart rate, myxedema) are described. Measurement of luteinizing hormone would be useful if the clinician suspected ovarian failure. However, follicle-stimulating hormone is a better measure of ovarian failure because it rises higher than luteinizing hormone if there is ovarian dysfunction. Rare pituitary tumors produce luteinizing hormone, but these tumors do not produce neuroendocrine symptoms in females unless they also produce follicle-stimulating hormone.

References:

