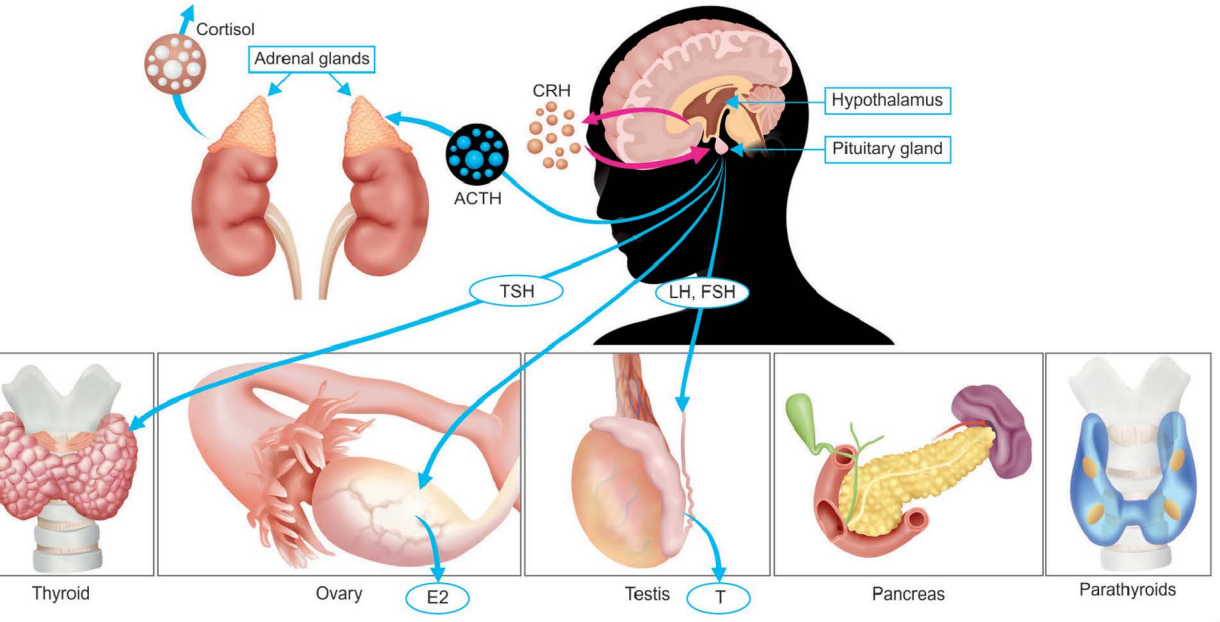
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Approach to Clinical Endocrinology through Selected Cases

Chandar Mohan Batra
Pramila Kalra

Foreword
Prasanna Kumar KM

JAYPEE

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3 CHAPTER Sheehan's Syndrome

Indira Maisnam

INTRODUCTION

Sheehan's syndrome is postpartum pituitary failure due to pituitary infarction following massive postpartum hemorrhage (PPH). It is not an uncommon cause of hypopituitarism in certain regions of the world. A chronic and progressive condition, diagnosis of Sheehan's is often delayed because of nonspecific symptoms and lack of awareness, thereby increasing disease-associated morbidity and mortality. Timely diagnosis and replacement of deficient hormone improves quality of life.

CASE HISTORY

Case 1

A 42-year-old lady was brought to the emergency department with acute onset confusion and drowsiness. She had been unwell for the past 1 week due to fever, cough and expectoration, and had taken some over-the-counter medication but her symptoms persisted.

On examination, she was drowsy with a Glasgow Coma Scale (GCS) of 8/15 and a temperature of 102°F. Her pulse was 68/min and regular; BP was 86/60 mm Hg. She was anemic with poor nutrition; had fine wrinkling around the eyes and the mouth; and had sparse axillary and pubic hair with breast atrophy. On chest auscultation, there were crepitations in the right infra-axillary region. There was no neck rigidity and plantar reflex was bilaterally nonresponsive.

Emergency reports showed neutrophilic leukocytosis and serum sodium of 115 mg/dL. Urine osmolality and urinary sodium were high at 370 mOsmol/kg and 44 mEq/L. Random capillary blood glucose was 55 mg/dL. Chest X-ray showed a pneumonic consolidation in the right lower lobe. Gram-positive cocci in clusters was seen on Gram-stain. Sputum was sent for culture and sensitivity. All other relevant investigations were normal.

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Fine facial wrinkling, sparse sexual hair and breast atrophy, anemia and poor nutrition, hypotension and relative bradycardia (despite fever), hyponatremia and hypoglycemia pointed to the possibility of hypopituitarism.

A provisional diagnosis of community-acquired pneumonia (CAP) with severe euvolemic hyponatremia with high urine sodium and osmolality and possible hypopituitarism was made. She was started on intravenous antibiotics based on local protocol for CAP. She was given 3% saline for hyponatremia correction and dextrose infusion for hypoglycemia. Suspecting hypopituitarism, blood was sent for cortisol paired with adrenocorticotropic hormone (ACTH), thyroxine (T4), thyroid-stimulating hormone (TSH), luteinizing hormone (LH), follicle-stimulating hormone (FSH), prolactin, and insulin-like growth factor 1 (IGF-1). Then intravenous hydrocortisone 100 mg 6 hourly was initiated while laboratory reports were awaited. With antibiotics, saline, dextrose, and intravenous hydrocortisone she became conscious, oriented, and afebrile and could give a detailed history.

Her last child birth was 15 years back when she had delivered a full-term normal weight baby at home but was rushed to the hospital due to massive PPH. She remembers being very sick then and had received numerous units of blood transfusion at that time. She had lactational failure but did have some menstrual bleeding 3–4 times a few months after the birth of her last child after which she has been amenorrheic. She has always been weak ever since with asthenia, anorexia, and frequent postural symptoms. She was admitted on two more occasions earlier with hypotension and low sodium which improved with intravenous fluids.

Meanwhile, her endocrine reports came as follows: Serum cortisol 1.2 µg/dL, plasma ACTH 4.5 pg/mL, TSH 1.5 mIU/L, T4 3.6 µg/dL, serum LH 0.6 IU/mL, FSH 0.4 IU/mL, prolactin 2 ng/dL, and IGF-1 46 ng/mL suggesting a panhypopituitarism. MRI of the pituitary showed a completely empty sella.

A diagnosis of Sheehan's syndrome with panhypopituitarism was made. She was treated with intravenous hydrocortisone 100 mg 6 hourly which was gradually tapered. She was thereafter kept on a maintenance dose of oral hydrocortisone tablets 10 mg at 7 AM and 5 mg at 6 PM. She was started on 62.5 µg of levothyroxine (1.6 µg/kg) 3 days after start of hydrocortisone.

Case 2

A 30-year-old lady suffered massive PPH following the birth of her second baby by normal delivery. She complained of severe headache and vomiting and then lost consciousness. She was in hypovolemic shock and did not respond to resuscitative measures with blood transfusion, intravenous fluids, and inotropes, even if her vaginal bleeding was successfully controlled. She died 5 hours later. Autopsy revealed an enlarged grayish looking pituitary. Histopathological examination showed ischemic necrosis involving the entire anterior pituitary.

The postmortem findings suggested a pituitary apoplexy following massive PPH and a diagnosis of acute phase of Sheehan's syndrome was made.

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DISCUSSION

Introduction

Sheehan's syndrome is postpartum pituitary failure due to pituitary infarction following massive PPH. Pituitary failure may be complete or partial; and acute or slowly progressive. The clinical presentation was described extensively by Harold L. Sheehan in 1937. However, pituitary necrosis on autopsy specimen of postpartum women was described as early as 1913 and 1914 by Glinsky and Simmons respectively.

Epidemiology and Demographics

The prevalence of Sheehan's syndrome varies in different regions of the world. Incidence is low in developed nations but higher in the developing nations due to domiciliary delivery and inadequate institutional obstetric care. In Kashmir, India, the prevalence of Sheehan's syndrome was estimated to be 3.1% of parous women ≥20 years of age and 63% of these women had delivery at home. One study from Turkey found Sheehan's syndrome to be the most common cause of hypopituitarism in women and Sheehan's syndrome was the 3rd most common cause of hypopituitarism in Philippines. Data from developed nations like USA, UK, and Japan showed the development of Sheehan's syndrome in postpartum women to be nil or very low. However, migration of women who delivered in their native countries to the developed world has increased the prevalence of Sheehan's in the developed nations. Therefore, physicians in both the developing and developed world need to be aware of this clinical entity which has a highly heterogeneous presentation.

In a study from Kolkata, India, the age of presentation ranged widely from 28 to 71 years. Another data from Turkey showed the typical age of presentation as 52.8 ± 12.3 years. The mean diagnostic delay can range from 7 to 27 years in studies from India, France, and Turkey. The delay is due to the nature of disease presentation which is typically nonspecific characterized by anorexia, asthenia, nausea, and postural symptoms; the overlooking or sometimes absence of typical symptoms like amenorrhea, lactational failure, and lack of awareness among physicians.

PATHOPHYSIOLOGY AND RISK FACTORS

The basic mechanism behind the development of postpartum pituitary infarction is the physiological enlargement of pituitary in pregnancy that predisposes it to ischemia due to increased vascular demand and/or compression of the vasculature by the enlarging pituitary gland. Following a PPH, hypovolemic shock-induced vasospasm of the arteries supplying the pituitary compromises the vascular supply of the enlarged pituitary which already has a precarious blood supply. Pregnant women who develop massive hemorrhage from other causes like gastrointestinal bleeding can

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develop pituitary infarction, suggesting that an enlarged pituitary with a compromised blood supply is required for its pathogenesis.

Nonpregnant individuals who develop massive hemorrhage do not develop pituitary infarction as the physiological demands of the pituitary are not increased. An exception is in the case of hematotoxic snake bite, where hemorrhagic necrosis of the normal-sized pituitary occurs along with massive bleeding at other sites. Toxins released from the hematotoxic snakes cause hemorrhage. This frequently results in hypopituitarism which can develop immediately or over the years. Hypopituitarism following hematotoxic snake bite is not an uncommon cause of hypopituitarism in endemic areas in India.

However, neither all patients with Sheehan's syndrome have a history of massive PPH nor do all patients with massive PPH develop Sheehan's syndrome. Thus, other factors contribute to pituitary infarction following PPH. These are small size sella, vasospasm, thrombosis, and clotting anomalies. In a study involving 114 patients with Sheehan's syndrome, the mean sella volume in patients with Sheehan's was 340.5 ± 214 mm^3 which was significantly lower than healthy women 602.5 ± 192 mm^3. When sella is small, the enlarged pituitary can easily compress the hypophyseal arteries against the sella turcica and the diaphragmatic sella compromising blood supply. Genetic mutations predisposing to procoagulant states are important risks for Sheehan's syndrome through thrombophilia and thrombosis. Important are mutations of coagulation factor V (F5), coagulation factor II (F2), methylenetetrahydrofolate reductase (MTHFR*C677T and MTHFR*A1298C), and plasminogen activator inhibitor type-1 (PAI-1).

Enlargement of the pituitary gland during pregnancy is contributed mainly by lactotroph hyperplasia which accounts for the increased prolactin levels in pregnancy, thereby preparing the breast for lactation. Studies have shown that in pregnancy there is decrease in the gonadotrophs and somatotrophs whereas the thyrotrophs and corticotrophs remain unchanged. In the first trimester, the pituitary enlarges by 45% and near term it is enlarged by 120–136%. The height of the pituitary increases from 4 to 8 mm to 10 mm at term and 12 mm in the immediate postpartum period. The pituitary comes back to prepregnancy size at around 6 months postpartum.

Certain characteristics of the vascular supply of the pituitary predisposes not only to infarction but specifically to involvement of certain areas of the pituitary. Briefly, the anatomy and blood supply of the pituitary can be described as follows. The pituitary which resides in the sella turcica has an anterior lobe (adenohypophysis) and a posterior lobe (neurohypophysis). The adenohypophysis has three parts: The pars distalis is the main component and secretes the anterior pituitary hormones, the pars intermediate is compressed in humans and the pars tuberalis surrounds the infundibulum or the stalk of the pituitary. The pars tuberalis, median eminence, and infundibulum receive blood supply from the superior hypophyseal artery

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and neurohypophysis receives blood supply from the inferior hypophyseal arteries; both of which arise (directly or indirectly) from the internal carotid artery. However, the blood supply of the pars distalis which is the main hormone producing area of the anterior pituitary is mostly via the venous drainage of the long and short portal veins. This unique circulation allows the pars distalis to receive hormones and substances from the hypothalamus, posterior pituitary, and periphery but predisposes it to ischemia. Lactotrophs and somatotrophs which are present in the lateral wings of the pituitary and dependent on portal (venous) circulation are mostly affected following a pituitary infarction. Corticotrophs and thyrotrophs are present in the median edge and the gonadotrophs are scattered throughout the pituitary. Their functions may, therefore, be completely or partially preserved for some time depending on the extent of the pituitary insult. Though rare, the posterior pituitary can also be involved resulting is diabetes insipidus (DI). But associated hypocortisolism and hypothyroidism can mask the polyuria and hypernatremia of DI which can be unmasked when hypocortisolism and hypothyroidism are treated.

Infarction leads to ischemic necrosis of the pituitary which is replaced subsequently by a fibrous scar with resultant volume loss. This produces a completely or a partially empty sella. Earlier authors had wrongly attributed the pituitary necrosis to puerperal sepsis. The destruction of the pituitary is not only chronic but also progressive. Thus, the presentation of the disease is both chronic and progressive (acute presentations, though rare are also seen as in Case 2). Over the years more pituitary cell lines can get affected. Therefore, it is difficult to explain the hormonal loss over the years to the acute insult at the time of disease initiation, and thus other factors are believed to be involved in the pathogenesis of this condition. Important among these is autoimmunity. The release of the normally sequestered pituitary antigens following ischemic necrosis can incite an autoimmune reaction that further accelerates the disease progression. A study from India showed that more women with Sheehan's syndrome (following PPH) had antibodies against pituitary antigens compared to normal women and postpartum women with hypopituitarism but no history of PPH. The antibody detected was against a 49-kDa pituitary cytosolic protein, neuron-specific enolase.

To summarize, Sheehan's syndrome occurs as a result of infarction of the enlarged pituitary due to massive PPH. Other factors predispose to pituitary ischemia and subsequent infarction. The pituitary destruction can be thought to have an acute initiation phase where a significant amount of the pituitary is destroyed by ischemic necrosis. This is followed over the ensuing years by a progressive phase of pituitary destruction where autoimmunity and possibly yet unknown factors contribute. If the initial phase cause massive necrosis, pituitary apoplexy can develop and this can be immediately fatal. More frequently the disease presents as a chronic progressive one with myriad clinical features.

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Clinical Features

The classical criteria for the diagnosis of Sheehan's syndrome are: (1) Obstetrical history of severe PPH; (2) Severe hypotension or shock necessitating blood transfusion or fluid replacement; (3) Lactational failure; (4) Failure to resume regular menses after delivery; (5) Varying degree of anterior pituitary insufficiency; and (6) Partial or complete empty sella on imaging.

However, clinical features of Sheehan's syndrome are highly variable ranging from acute pituitary failure to the more common chronic progressive hypopituitarism with heterogeneous presentation. Sheehan himself noted the functional loss of the pituitary hormones was progressive but varied widely. He found that 17 of 112 women with complete glandular destruction at autopsy menstruated for varying periods, and 2 even had subsequent pregnancy. In a study of 114 women with Sheehan's syndrome, nonspecific symptoms were seen in >50% of affected women. The study also found higher incidence of complicated pregnancies in women who developed Sheehan's compared to baseline prevalence. The authors attributed their findings to the possibility of procoagulant states predisposing to both Sheehan's syndrome and pregnancy complications. In the same study 37.7% of the women reported breastfeeding normally for 15.1 ± 7 months; and while most (85.1%) had amenorrhea, 14.9% patients had regular menses for 32.2 ± 3.2 months after the last delivery. In a study from Kolkata, 94.4% patients had lactational failure; 72.2% did not menstruate after last child birth. Thus, lactational failure and amenorrhea though frequent are not sine qua non for the diagnosis of Sheehan's syndrome.

Acute presentation of Sheehan's (Case 2) in the immediate postpartum, though rare, can be fatal if not correctly diagnosed and treated. Patients present with features of pituitary apoplexy like headache, visual symptoms, loss of consciousness, and agalactia; and features of adrenal insufficiency like extreme fatigue, nausea, vomiting, hypotension, shock, hypoglycemia and hyponatremia. Posterior pituitary involvement can lead to DI.

Typically, Sheehan's has a chronic presentation and nonspecific symptoms dominate the clinical picture. The nonspecific symptoms are chronic ill-health, asthenia, anorexia, premature ageing, sleep disturbances, and mood disorders. If carefully searched for, most patients would have lactational failure, amenorrhea, and regression of secondary sexual characters. However, patients frequently are diagnosed in stressful condition that precipitates an acute adrenal insufficiency like surgery or severe infection as in our patient in Case 1.

Growth hormone and prolactin are the most commonly affected hormones whereas ACTH and TSH are among the last to be affected. This is explained by the distribution of the various pituitary cells and could be nature's way of preserving the hormones most vital for survival. It is,

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however, emphasized here again that there is no one way of involvement; and any combination and degree of hormone deficiency can occur in Sheehan's syndrome. The prevalence of ACTH and TSH deficiency ranges from 80% to 100% in various studies. Though rare, the posterior pituitary can be involved. DI can occur in 5% and partial DI can occur in one-third of patients. Coexisting hypocortisolism and hypothyroidism can mask the features of DI. Bone loss occurs in Sheehan's syndrome and multiple pituitary hormone deficiency is a strong contributory factor.

When patients with (chronic) Sheehan's syndrome present acutely, they often do so because of adrenal crisis (Case 1). Frequently, there is a stressful condition which precipitates adrenal crisis in a patient with latent ACTH deficiency. Deficiency of other anterior pituitary hormones like thyrotropin and growth hormone frequently deteriorates the clinical picture. Hyponatremia is the most frequent electrolyte disturbance in patients with Sheehan's syndrome ranging from 21% to 59%. Adrenal insufficiency and hypothyroidism cause hyponatremia by decreasing free water clearance. Increased antidiuretic hormone (ADH) worsens hyponatremia and it can occur because of the stimulation of its release by corticotropin-releasing hormone (CRH), hypovolemia-induced ADH release and acute illness (e.g., pneumonia) related syndrome of inappropriate antidiuretic hormone secretion (SIADH). The hyponatremia is a euvolemic hyponatremia with high urine osmolality and sodium like SIADH. Thus, in all cases of suspected SIADH, thyroid and adrenal function must be assessed. Hypoglycemia is another important finding. One study found Sheehan's syndrome to be the second most common cause of hypoglycemia. Adrenal insufficiency, hypothyroidism, growth hormone deficiency, and poor nutritional intake all contribute to the hypoglycemia. The presence of hyponatremia and hypoglycemia in a hypotensive patient (sometimes in shock), with anemia, facial wrinkling and loss of secondary sexual characters suggest hypopituitarism. If a history of PPH is available, Sheehan's syndrome is established; and this can be confirmed by relevant laboratory and imaging reports.

Diagnosis

Laboratory Investigation

In patients presenting acutely blood sample for ACTH and cortisol should be drawn before urgent resuscitation. They will be found to be low. T4, TSH, LH, FSH, IGF-1, and prolactin can all be low. Patients often have hyponatremia and hypoglycemia.

Prolactin and growth hormone are the most commonly affected hormones but as mentioned before there is no specific pattern of hormonal loss. The progressive nature of the disease means that more hormones may be affected over the ensuing years. Low basal levels of prolactin suggest prolactin deficiency. In patients with amenorrhea, low or normal basal LH

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and FSH levels suggest central hypogonadism. This will be accompanied by low basal estradiol (E2) levels.

Low morning (8–9 AM) serum cortisol with low or normal ACTH levels suggests central hypocortisolism. Morning serum cortisol below 3 μg/dL confirms cortisol deficiency and this along with a low or normal ACTH confirms secondary adrenal insufficiency. Morning basal cortisol >18 μg/dL confirms cortisol sufficiency but in those with cortisol between 3 and 18 μg/dL stimulation tests are needed to test the ACTH reserve. Stimulation tests commonly performed are ACTH stimulation tests and insulin tolerance test (ITT). It should be kept in mind that the ACTH stimulation test may be normal if Sheehan's is of recent onset (<6 weeks) as the adrenals have not yet atrophied and would therefore respond to exogenous ACTH. During ITT, in normal persons, serum cortisol increases to ≥18 μg/dL when the serum glucose falls to <50 mg/dL. Insulin tolerance test is the gold standard but is contraindicated in patients with seizures and ischemic heart disease. Other tests to detect ACTH reserve are glucagon stimulation test, measurement of overnight metyrapone stimulation, and CRH testing.

Low thyroxine and low or normal TSH concentrations confirms the diagnosis of central hypothyroidism in the absence of nonthyroidal illness. The symptoms of central hypothyroidism are similar to but less severe than primary hypothyroidism and there is absence of a goiter. Sometimes, the TSH levels may be slightly increased in central hypothyroidism due to sialylation of TSH that prolongs its half-life but decreases its biological activity.

Low IGF-1 levels with at least three anterior pituitary hormone deficiencies are conclusive diagnosis of growth hormone deficiency and no further testing is required. Stimulation testing is done to document growth hormone deficiency in other situations. ITT is the gold standard. Other tests are growth hormone-releasing hormone (GHRH), arginine, clonidine, levodopa (L-DOPA), and the combination of arginine and L-DOPA stimulation testing.

Posterior pituitary involvement with (ADH) deficiency can occur in Sheehan's syndrome. The clinical picture may be masked by coexisting hypocortisolism and hypothyroidism. DI causes polyuria (>3 L/day) and can be confirmed by water deprivation test. A urine osmolality of <300 mOsmol/kg in the presence of fluid deprivation and subsequent response to arginine vasopressin (AVP) is suggestive of central DI. Copeptin, the C-terminal moiety of AVP is a stable marker of AVP concentrations. A combination of a fluid deprivation test with hypertonic saline challenge using copeptin measurements provides an accurate diagnosis in 96% of patients presenting with polyuria and polydipsia.

The most common electrolyte abnormality is hyponatremia. Other electrolyte abnormalities like hypokalemia, hypomagnesemia, hypocalcemia, and hypophosphatemia have been reported. Patients typically have normocytic normochromic anemia, thrombocytopenia, and sometimes pancytopenia. Coagulation abnormalities are also reported.

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Imaging

Pituitary MRI shows a completely or a partially empty sella in around 70% and 30% of individual with Sheehan's syndrome respectively. Progressive atrophy of the gland following the initial ischemic necrosis produces this picture. Rarely, normal looking pituitary gland has been reported. In acute Sheehan's syndrome, a non-hemorrhagic enlarged pituitary with a small rim of gadolinium enhancement is seen. The pituitary is enlarged much more than would be expected in a normal gestation.

Management

If after the control of postpartum hemorrhage, and after adequate intravenous fluids replacement and blood transfusion a woman remains hypotensive, acute phase of Sheehan's should be suspected (Case 2). She should be evaluated and treated for adrenal insufficiency immediately; evaluation of other hormonal deficiencies can be deferred until 4 to 6 weeks postpartum. Immediate management of secondary adrenal insufficiency includes injection hydrocortisone 100 mg 6 hourly and dextrose and saline infusion. Dose will be adjusted based on clinical and biochemical monitoring of the patient.

Replacement of deficient hormones and regular screening for new deficiencies form the basis of treatment in the chronic phase of Sheehan's syndrome. Importantly, management of other complications of hypopituitarism like cardiometabolic and bone health is important to improve morbidity and mortality outcomes. Mortality is higher in Sheehan's syndrome by 1.2–2.7 times.

The replacement of cortisol deficiency is the most important aspect of the hormone replacement. Hydrocortisone or cortisone acetate (where available) are preferred. Aim of replacement is to provide a daily dose that would be physiological and mimic the circadian serum cortisol profile. Studies have shown that the mean cortisol production in healthy individuals is 15.5–19 mg/day and adverse metabolic effects have been seen in hypopituitarism receiving >20 mg/day. So, the daily dose should never be >30 mg/day and should be much lower than that. Patients with partial deficiency can be advised low dose (5–10 mg/day) or stress dose of hydrocortisone. Patients should be advised to double their dose of glucocorticoids during an illness and a steroid card must be provided. All patients should have an emergency kit of parenteral hydrocortisone administration. Monitoring should look for clinical features of glucocorticoid excess or deficiency supported by laboratory reports of electrolytes and glucose. Addition of 20–50 mg of dehydroepiandrosterone (DHEA) may improve well-being and libido.

Levothyroxine replacement should be given only after the patient has had adequate glucocorticoid replacement for at least few days, otherwise an adrenal crisis can be precipitated. This is because thyroid hormone

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replacement increases demand and clearance of cortisol. The typical dose is 1.6 μg/day and the starting dose and dose titration should be chosen with caution in all elderly patients and in those ischemic heart disease. Monitoring is to be done by assessing T4 or free thyroxine (FT4) concentration with blood drawn before the morning dose of levothyroxine.

In women <50 years (usual age of menopause), estrogen and cyclic progesterone are often given in the absence of contraindications (deep vein thrombosis, pulmonary embolism, cirrhosis of liver, acute hepatitis and uncontrolled hypertension). Younger women need higher dose of estrogen whereas lower doses are needed in older women. Transdermal estrogen compared to oral estrogen causes less effect on lipids, coagulation, inflammation, and levels of binding proteins. Gonadotropins have been tried for fertility with successful pregnancy in few cases. Regular follow-up and adjustment of glucocorticoid dose is necessary once patient becomes pregnant.

Opinion is mixed on the use of growth hormone in Sheehan's syndrome. Studies have shown that growth hormone replacement improves body composition and cardiometabolic health. The dose in adult is low and dose adjustment is done by titrating the IGF-1 levels to the normal age adjusted levels every 4–6 weeks. Oral estrogen replacement attenuates serum IGF-1 response to growth hormone. If oral estrogen is withdrawn or replaced by transdermal estrogen growth hormone, dose reduction is required. Growth hormone treatment can unmask central hypothyroidism and central adrenal insufficiency and therefore thyroid and adrenal function needs to be monitored in individuals started on growth hormone; and dose adjustments may be needed in individuals already on levothyroxine and glucocorticoid replacement.

For the treatment of DI, desmopressin tablets in two or three divided daily doses, or nasal preparations one to two times daily are used. When administered nasally, antidiuretic effects of desmopressin start between 6 and 12 hours. When switching to oral from intranasal, oral desmopressin should start at least 12 hours after the last intranasal dose.

Differential Diagnosis

Two important differential diagnosis of Sheehan's syndrome are lymphocytic hypophysitis and bleeding in a pre-existing pituitary adenoma.

Acutely lymphocytic hypophysitis can present with headache, visual symptoms, and hypopituitarism; in the chronic stage lymphocytic hypophysitis can lead to empty sella with hypopituitarism. It may be difficult to differentiate these features from the acute and chronic presentations of Sheehan's syndrome. Distinguishing features from Sheehan's syndrome are absence of severe PPH, history of autoimmunity, presence of DI, hyperprolactinemia, and some imaging characteristics in lymphocytic hypophysitis. MRI findings in lymphocytic hypophysitis are pituitary and infundibular enlargement with symmetrical and homogenous gadolinium

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enhancement, loss of the posterior pituitary bright spot, and presence of a dura tail.

Bleeding into a pre-existing adenoma in the postpartum period may mimic acute Sheehan's syndrome. Proper history and imaging features can differentiate the two. History of massive PPH suggest Sheehan's syndrome. An enlarged pituitary on imaging can be seen in both conditions; but an enlarged pituitary with a wide sella would suggest a pre-existing adenoma. Spontaneous shrinkage of the pituitary mass after a few months and absence of local invasion suggest Sheehan's syndrome.

Coming Back to Our Patients

Case 1: The patient improved following hydrocortisone and levothyroxine replacement. She was also given oral estrogen and progesterone preparation, after contraindications to their use were ruled out. Growth hormone was not given due to cost issue and reluctance to daily injections. She was also provided calcium and vitamin D supplementation. Her cardiometabolic health was assessed and she was found to be dyslipidemic with high low-density lipoprotein cholesterol (LDL-C), triglycerides, and low high-density lipoprotein cholesterol (HDL-C) and was started on atorvastatin 20 mg/day at bedtime.

Case 2: This case highlights the importance of heightened awareness about the acute phase of Sheehan's syndrome among the treating physicians. Acute resuscitative measures with hydrocortisone, intravenous saline, and dextrose could be life-saving.

Prevention

The awareness of this condition is the first step in its prevention. Discouraging home deliveries and providing adequate obstetric care are vital. The possibility of an acute Sheehan's in a women who do not respond to resuscitative measures following a PPH should be kept in mind and should be managed accordingly. All women who survived a PPH should be followed up regularly for pituitary function assessment, so that she may never present in a crisis. Guidelines for follow-up of such women must be well established as for women with a history of gestational diabetes mellitus.

CONCLUSION

Sheehan's syndrome is not a rare cause of hypopituitarism in developing countries. The disease is chronic and progressive, and more pituitary hormones can be affected over the years. Diagnosis is often missed because of nonspecific symptoms and lack of physician awareness; and patients frequently present in an acute state. Adequate obstetric care, recognition of acute phase and follow-up of all women with PPH can improve outcomes. Sufficient hormone replacements are available which can improve the quality of life of affected women.

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- It elucidates various practical problems faced and its management in the patients in an understandable way.
- This book will provide good learning material to practising endocrinologists, DM and DNB students of endocrinology, internists, physicians, and general practitioners interested in endocrinology.

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