TEST BANK

Scientific Team

الفريق العلمي

Done by: Volunteer

Reviewed by:

Physiology test bank

The plasma level of adrenocorticotrophic hormone (ACTH)

A Is normally maximal around midnight.

B Is regulated mainly by the blood cortisol level.

C Shows exaggerated circadian fluctuations with an adrenal tumour.

D Is raised in the presence of complete adrenal failure.

E Is reduced in patients on long-term high dosage glucocorticoids.

A. False It is maximal around the time of awakening.

B. False This feedback system is over-ridden by the hypothalamic circadian rhythm.

C. False The level is high but the circadian rhythm is lost.

D. True Due to loss of negative feedback by cortisol.

E. True ACTH is suppressed by these exogenous glucocorticoids.

An adrenal medullary tumour (phaeochromocytoma) may cause an increase in

A. Systolic blood pressure which may be transient or constant.

B. Tremor of the extended hand.

C. Basal metabolic rate.

D. Diastolic arterial pressure which does not respond to alpha adrenoceptor blocking drugs.

E. Urinary catecholamines

A. True Due to phasic or tonic release of adrenaline and/or noradrenaline.

B. True Due to beta adrenoceptor stimulation by adrenaline.

C. True Due to release of adrenaline.

D. False -receptor blockers typically lower the blood pressure.

E. True this is a diagnostic feature.

Insulin

A. Requirements at night are similar to those during the day.

B. Half-life is usually reduced in patients with diabetes mellitus.

C. Is partly bound to proteins in the blood.
D. Requirements are increased in obesity.

E. Requirements are increased by exercise.

A. False Insulin is required mainly in response to meals.

B. False The disease is not usually due to rapid insulin breakdown.

C. True Abnormal binding may occur in diabetes mellitus.

D. True Obese patients usually show increased insulin resistance.

E False Exercise reduces insulin requirements.

Destruction of the anterior pituitary gland causes

A Amenorrhea

B. Diabetes insipidus.

C. Skin pallor.

D. Impaired ability to survive severe stress.

E. A fall in basal metabolic rate (BMR).

A. True Due to absence of FSH and LH.

B. False ADH is released from the posterior pituitary.

C. True Due to loss of ACTH and melanocyte-stimulating hormone (MSH) actions.

D. True Due to loss of ACTH and failure of the cortisol surge in response to stress; loss of TSH and consequent hypothyroidism also contribute.

E. True BMR falls due to loss of TSH drive to the thyroid.

In severe diabetes mellitus, there may be a fall in

A. Extracellular fluid osmolality.

B Appetite.

C Blood volume.

D Arterial blood pH to below 7.0.

E Blood bicarbonate to half its normal value

A. False it rises due to excess glucose molecules plus water loss.

B. False it is increased due to loss of glucose in the urine.

C. True Due to osmotic diuresis and vomiting.
D. True this indicates life-threatening acidosis.

E. True Bicarbonate is used up buffering the keto-acids.

Excessive glucocorticoid production (Cushing's syndrome) causes an increase in

A. Skin thickness.

B. Bone strength.

C. Blood glucose.

D. Arterial pressure.

E. The rate of wound healing.

A. False Skin is thin due to protein catabolism; striae appear.

B. False Bones are weakened by breakdown of the protein matrix.

C. True Due mainly to gluconeogenesis.

D. True Due to the salt and water retention caused by gluco- and mineralocorticoids.

E. False Healing is slowed in this catabolic state

In diabetic ketosis there is a decreased metabolic breakdown of

A Ketones

B. Glycogen.

C. Glucose.

D. Fat.

E. Amino acids.

A. False Breakdown continues normally but ketones accumulate due to rapid production.

B. False Insulin normally inhibits glycogenolysis.

C. True Due to its impaired entry into the cells.

D. False Fat breakdown is increased to yield ketone bodies.

E. False Gluconeogenesis and amino acid catabolism increase.

An oral glucose tolerance test in a patient with

A. Diabetes mellitus shows a higher than normal fasting blood glucose level.

B. Diabetes mellitus shows glycosuria when blood glucose is three times the normal fasting level.

C. Diabetes mellitus shows a delayed return to the fasting blood glucose level.

D. An insulin-secreting tumour shows no rise in blood glucose level during the test.

E. Malabsorption syndrome shows a lower than normal peak level for blood glucose.

A. True The level is higher due to impaired glucose homeostasis even in the fasting state.

B. True The renal threshold for glucose is about twice the normal fasting level.

C. True Due to impaired insulin response to the glucose stimulus.

D. False Blood glucose rises but then falls to a low level due to excessive insulin secre- tion.

E. True The curve is flattened due to impaired glucose absorption.

Aldosterone secretion is increased by an increase in plasma

A. Volume

B. Osmolality.

C. Potassium concentration.

D. Renin concentration.

E. ACTH concentration.

A. False This reduces aldosterone secretion.

B. False This increases adrenocortical hormone (ADH) secretion.

C. True K-has a direct stimulatory effect on the adrenal cortex.

D. True This leads to formation of angiotensin II which stimulates the cortex.

E. True Though the main action of ACTH is on glucocorticoid secreting cells; it has some action on mineralocorticoid secreting cells.

An intravenous infusion of noradrenaline differs from one of adrenaline in that it

A. **Acts on alpha adrenoceptors.**

B. **Does not act on beta adrenoceptors.**

C. **Raises total peripheral resistance.**

D. **Increases cardiac output.**

E. **Decreases skin blood flow.**

A. False Both act on alpha receptors but noradrenaline is the more potent stimulant.

B. False Both act on beta receptors but adrenaline is the more potent stimulant.

C. True Noradrenaline raises but adrenaline reduces it.

D. False Adrenaline raises but noradrenaline reflexly reduces it.

E. False Both constrict skin vessels due to their alpha receptor stimulant properties.

Antidiuretic hormone (vasopressin)

A. Is released from nerve endings in the posterior pituitary gland.

B. Tends to raise the osmolality of plasma rise.

C. Increases the permeability of the cells in the loop of Henle to water.

D. Secretion is little affected by changes in plasma osmolality of less than 10 per cent.

E. Secretion increases when plasma volume falls but osmolality is unchanged.

A. True it is formed in neurones whose cell bodies lie in the hypothalamus and whose axons transport it to the posterior pituitary gland.

B. False the water retention it induces makes plasma osmolality fall.

C. False it increases the permeability of the collecting ducts.

D. False Secretion is affected by 1 per cent changes in osmolality; the sensitivity of the hypothalamic receptors to osmolar change accounts for the constancy of plasma osmolality.

E. True Volume changes detected by vascular low-pressure receptors affect ADH secre- Tion

Pancreatic glucagon

A. Is produced by the beta cells of the islets of Langerhans.

B. Is a polypeptide.

C. Output is inversely proportional to the blood glucose level.

D. Has a half-life in the circulation of 3–4 hours.

E. Increases the breakdown of liver glycogen.

A. False It is produced by the alpha cells.

B. True It is quite similar in structure to secretin.

C. True It normally prevents a serious fall in blood glucose.

D. False It is much shorter (5–10 minutes); this allows glucagon levels in the blood to adjust rapidly to changes in blood glucose levels.

E. True It also mobilizes fatty acids.

Adrenaline secretion from the adrenal glands increases the

A. Blood glucose level.

B Blood free fatty acid level.

C Blood flow to skeletal muscle.

D Blood flow to the splanchnic area.

E Release of renin in the kidneys

A. True By promoting glycogenolysis in the liver.

B. True By promoting lipolysis in the fat stores.

C. True By its predominant effect on beta-receptors in the smooth muscle of skeletal muscle arterioles.

D. False Splanchnic flow falls since alpha-receptors predominate in splanchnic arterioles.

E. True Juxtaglomerular cells respond to beta-receptor stimulation by releasing renin.

Insulin

A. **Stimulates release of free fatty acids from adipose tissue.**

B. **Secretion tends to raise the plasma potassium level.**

C. **Facilitates entry of glucose into skeletal muscle.**
D. **Facilitates entry of amino acids into skeletal muscle.**

E. **Secretion is increased by vagal nerve activity.**

A. False It stimulates uptake of fatty acids by adipose tissue.

B. False It lowers it by promoting potassium uptake by cells.

C. True Thus lowering the blood sugar level.

D. True Thereby favouring anabolism.

E. True This mobilizes insulin at the beginning of a meal.

Adrenaline differs from noradrenaline in that it

A. **Increases the heart rate when injected intravenously.**

B. **Is the main catecholamine secreted by the adrenal medulla.**

C. **Increases the strength of myocardial contraction.**

D. **Is a more potent dilator of the bronchi.**

E. **Constricts blood vessels in mucous membranes.**

A. True Noradrenaline injection causes reflex slowing of the heart.

B. True Adrenaline constitutes some 80 per cent of this secretion.

C. False Both increase the strength of myocardial contraction.

D. True It has stronger beta effects (including bronchodilation).

E. False Both vasoconstrict ('decongest') mucous membranes.

Hormones secreted by the adrenal cortex

A. Include cholesterol.

B. Are mostly bound to plasma proteins.

C. Include sex hormones.

D. Are excreted mainly in the bile after conjugation.

E. Are essential for the maintenance of life.

A. False This is not a hormone.

B. True For example, the globulin transcortin binds cortisol.

C. True In both sexes they stimulate the growth of axillary and pubic hair.
D. False After conjugation they are excreted mainly by the kidney.

E. True Without replacement therapy, loss of adrenal cortical function results in death.

Inhibition of angiotensin-converting enzyme (ACE) decreases the

A . Formation of angiotensin II.

B. **Plasma renin level.**

C. **Work of the heart.**

D. **Circulating level of angiotensin I.**

E. **Total body potassium**

A. True The enzyme converts angiotensin I into angiotensin II.

B. False Plasma renin rises as the blood pressure falls.

C. True The fall in blood pressure it causes decreases the work of the heart and can be an effective treatment for some types of heart failure.

D. False It rises due to the increased renin and the inability to convert to angiotensin II.

E. False Due to the fall in aldosterone secretion, less potassium