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CAUSES, CLINICAL FEATURES, DIAGNOSIS, CLINICAL PRESENTATION, BIOCHEMICAL TESTING, IMAGING STUDIES, OTHER DIAGNOSTIC TOOLS, DIFFERENTIAL DIAGNOSIS AND TREATMENT OF ACROMEGALY.

Vikunta Rao. V[1] , Muralinath E. [1] , Manjari P.[1] , Sravani Pragna K.[1] KALYAN C.[1] Guru Prasad M[2] , Venkat Navven. A[3], Sravani. K.[4] , Sony Sharlet. E [5]

[1]College of Veterinary Science, Proddatur, Andhra Pradesh, India.
[2]Vaishnavi microbial Phama pvt.ltd, Hyderabad, India
[3]Technical Sales Officer, Vijayawada, Andhra Pradesh, India
[4]Veterinary Officer, Nuzivedu, Andhra Pradesh, India
[5]Veterinary college, Tirupati, Andhra Pradesh, India

ABSTRACT:-

Acromegaly is a rare endocrine disorder occurred by an over production of growth hormone. Causes of acromegaly include benign tumor of pituitary gland, over production of growth hormone as well as genetic predisposition. Clinical features of acromegaly are acral enlargement, prognatism, kyphosis, soft tissue as well as facial chanjes, hyper glycemia, hypertension, hypogonadism, thyroid dysfunction and cardiomyopathy. Diagnosis is based on MRI and CT scan. Treatment is dependent on somatostatin analogs, dopamine agonists, GH receptor antagonists.

KEY WORDS: Pituitary tumor, benign tumor of the pituitary glands, over production of GH, genetic predisposition, skeletal changes, acral enlargement, prognathism, kyphosis, coarse facial features, hyper glycemia, hypertension, hypogonadism, thyroid dysfunvtion, cardiomyopathy, hypertension, headaches, cognitive changes, imaging studies, oral glucose tolerance test, magnetic resonance imaging, bone density scan, cranio pharyngioma, hyper thyrroidism and radiation therapy.

Introduction:

Acromegaly is a rare endocrine disorder occured by the excessive production of growth hormone (GH) after the closure of the growth plates in adulthood. It primarily influences middle-aged adults, and its clinical features are a result of the overproduction of GH and subsequent elevation of insulin-like growth factor 1 (IGF-1).

Causes of Acromegaly

Pituitary Tumor (Adenoma):

Most common cause of Acromegaly.

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Benign tumor of the pituitary gland.

Overproduction of growth hormone (GH).

Genetic Predisposition:

In rare cases, genetic mutations can lead to excess GH production.

Familial forms of Acromegaly exist.

Gigantism:

Occurs in childhood due to GH excess before epiphyseal plate closure.

Can progress to Acromegaly if untreated.

Non-Pituitary Tumors:

Rarely, tumors outside the pituitary gland (e.g., lung, pancreas) can produce GH-releasing hormone.

Ectopic GH Production:

Occurs when tumors elsewhere in the body produce GH independently.

Idiopathic:

In some cases, the cause remains unknown.

Acromegaly typically results from an overproduction of GH, leading to excessive growth of tissues and bones in the body.

Clinical Features:

Skeletal Changes:

Gigantism:

In cases where the condition develops before the growth plates close, individuals may experience abnormal growth in height, known as gigantism.

Acral Enlargement:

Most characteristic feature; hands and feet grow larger with thickening of fingers and toes.

Prognathism:

Overgrowth of the jaw, leading to a prominent jawline.

Kyphosis:

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Abnormal curvature of the spine, often seen in long-standing cases.

Soft Tissue and Facial Changes:

Coarse Facial Features:

Thickened lips, enlarged nose, and widened spacing between teeth.

Increased Sweating:

Excessive perspiration due to increased metabolic activity.

Skin Tags and Wrinkles:

Skin abnormalities like skin tags and deepening wrinkles.

Endocrine Manifestations:

Hyperglycemia:

GH antagonizes the effects of insulin, leading to impaired glucose tolerance and diabetes mellitus.

Hypertension:

Elevated GH levels can cause increased blood pressure.

Hypogonadism:

Reduced sexual function and fertility due to hormonal imbalances.

Thyroid Dysfunction:

GH can affect thyroid hormone function.

Cardiovascular Symptoms:

Cardiomyopathy:

GH excess can lead to an enlarged heart and decreased cardiac function.

Hypertension:

Elevated blood pressure can increase the risk of cardiovascular events.

Neurological and Psychological Effects:

Headaches:

Frequent headaches due to the growth of pituitary tumors.

Visual Disturbances:

Tumors can compress the optic nerve, causing visual field defects.

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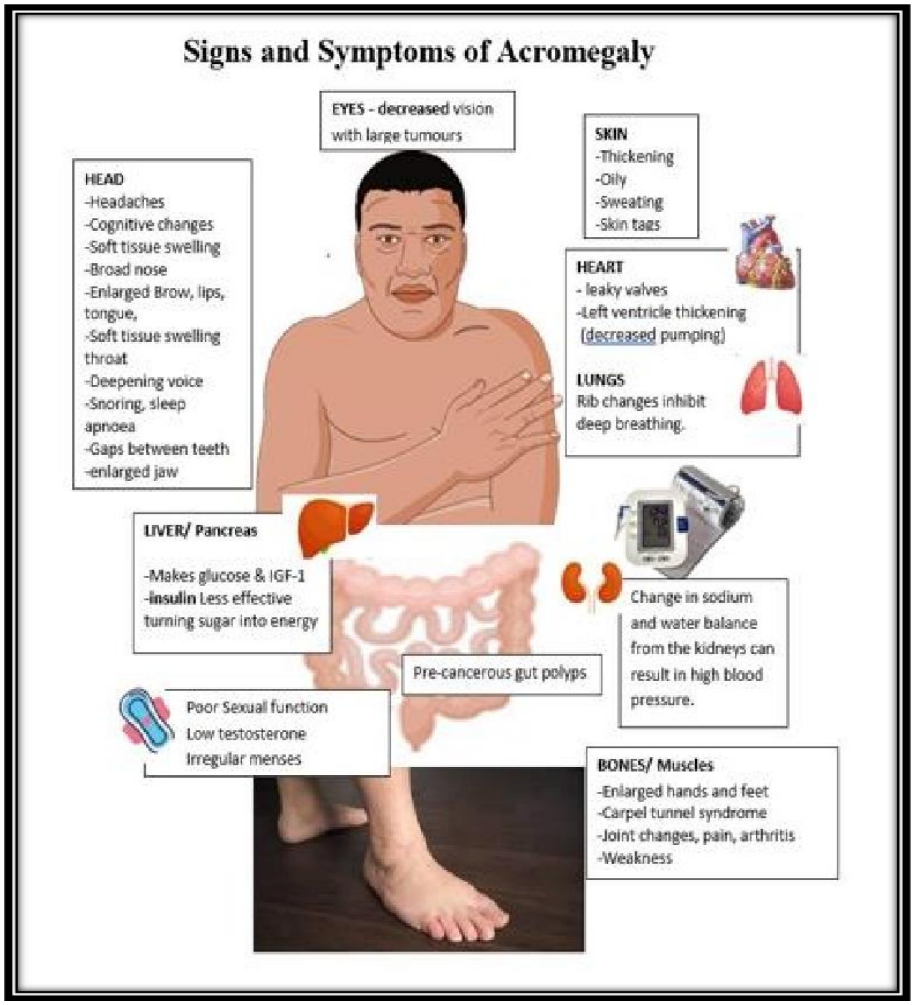
Cognitive Changes:

Some individuals may experience cognitive changes, including impaired memory and concentration.



Diagnosis:

Diagnosis of Acromegaly typically involves a combination of clinical evaluation, biochemical tests, and imaging studies.

Clinical Presentation:

Recognizing the physical signs:

Acromegaly is often characterized by gradual and progressive enlargement of body tissues, such as hands, feet, and facial features.

Common symptoms:

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Patients may experience symptoms like joint pain, fatigue, headaches, and changes in vision due to tumor compression on the optic nerve.

Biochemical Testing:

Insulin-like Growth Factor 1 (IGF-1):

Elevated levels of IGF-1 in the blood are a key indicator of acromegaly. It is a more reliable marker than growth hormone (GH) because GH levels can fluctuate throughout the day.

Oral Glucose Tolerance Test (OGTT):

In acromegaly, GH levels do not suppress properly during an OGTT, helping to confirm the diagnosis.

Imaging Studies:

Magnetic Resonance Imaging (MRI):

An MRI of the brain is used to locate and visualize the pituitary tumor responsible for excess GH production.

Computed Tomography (CT) Scan: Sometimes used if an MRI is contraindicated or inconclusive.

Other Diagnostic Tools:

Visual Field Testing:

To assess potential damage to the optic nerve due to tumor compression.

Bone Density Scan:

To evaluate bone health, as acromegaly can lead to increased bone density.

Differential Diagnosis:

It's important to rule out other conditions that may cause similar symptoms, such as gigantism (occurring in childhood) and other pituitary disorders.

Secondary Causes of GH Excess

Pituitary Adenoma-Related Conditions:

Prolactinoma: Elevated prolactin levels, galactorrhea, and menstrual irregularities

Cushing's Disease: Excess cortisol production, leading to weight gain, moon face, and hypertension

Non-functioning Pituitary Adenoma: No hormonal hypersecretion, but mass effect symptoms like headaches and visual disturbances

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Extrapituitary Tumors:

Ectopic GH-secreting tumors (e.g., lung, pancreas): GH excess without pituitary involvement

Other Hypothalamic-Pituitary Disorders:

Hypothalamic hamartoma: Disruption of hypothalamic function can affect GH regulation

Craniopharyngioma: Tumor near the pituitary/hypothalamus can cause hormonal imbalances

Non-Tumoral Conditions

Physiologic Variants:

Gigantism:

Excess GH secretion in childhood, leading to abnormal growth

Endocrine Disorders:

Hyperthyroidism:

Excess thyroid hormone can mimic some symptoms of acromegaly

Insulin resistance and metabolic syndrome: May lead to acromegaly-like features such as acanthosis nigricans.

Genetic Syndromes:

Carney Complex: Multiple endocrine neoplasias and cardiac myxomas

McCune-Albright Syndrome: Bone lesions, endocrine abnormalities

Multiple Endocrine Neoplasia Type 1 (MEN1): Pituitary adenomas and parathyroid tumors

Drug-Induced or Iatrogenic Causes:

Administration of GH or insulin-like growth factor-1 (IGF-1) for therapeutic purposes

Miscellaneous Causes:

Idiopathic hypersecretion of GH without identifiable cause

Endocrinology Consultation:

A specialist in endocrinology plays a crucial role in confirming the diagnosis, interpreting test results, and determining the appropriate treatment plan.

Multidisciplinary Care

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Acromegaly management often involves a team of healthcare providers, including endocrinologists, neurosurgeons, and radiologists, to provide comprehensive care.

Remember that early diagnosis and appropriate management are essential for improving the quality of life and preventing complications in individuals with acromegaly.

Treatment:

Medical Treatment:

Somatostatin Analogs: These drugs, such as octreotide and lanreotide, are often the first-line treatment to reduce growth hormone (GH) secretion.

Dopamine Agonists: Cabergoline may be used in some cases to lower GH levels.

Growth Hormone Receptor Antagonists: Pegvisomant is an option to block the effects of GH.

Combination Therapy: Sometimes, a combination of these medications is required for effective control.

Surgery (Transsphenoidal Surgery):

Removal of Tumor: Surgical removal of the tumor causing acromegaly can be curative if the entire tumor is successfully removed.

Partial Tumor Removal: In cases where complete removal is not possible, debulking surgery may be performed to reduce tumor size.

Radiation Therapy:

External Beam Radiation: Used when surgery and medications are not effective or as an adjunct therapy.

Stereotactic Radiosurgery: Precise radiation focused on the tumor.

Monitoring and Follow-Up:

Regular monitoring of GH and IGF-1 levels to assess treatment effectiveness.

Imaging to track tumor size and progression.

Management of Associated Symptoms:

Addressing comorbidities such as hypertension, diabetes, and cardiovascular issues.

Managing physical changes and complications like joint pain or sleep apnea.

Long-Term Care:

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Lifelong treatment and monitoring may be necessary even after successful surgery or medical therapy.

It's essential to note that the choice of treatment depends on individual factors, including the tumor's size and location, overall health, and the patient's preferences. Treatment plans are typically developed in collaboration with endocrinologists and neurosurgeons.

Conclusion:

Acromegaly is a complex endocrine disorder characterized by the excessive production of GH, resulting in a range of clinical manifestations affecting multiple organ systems. Early diagnosis and appropriate treatment are essential to prevent complications and improve the quality of life for individuals with this condition.

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