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**HYPERCALCAEMIA**

*Hypercalcemia is a relatively common clinical problem. It results when the* ***entry of calcium into the circulation exceeds the excretion of calcium into the urine or deposition in bone.*** *This occurs when there is accelerated bone resorption, excessive gastrointestinal absorption, or decreased renal excretion of calcium. In some disorders, however, more than one mechanism may be involved. As examples, hypervitaminosis D increases both intestinal calcium absorption and bone resorption, and primary hyperparathyroidism increases bone resorption, tubular calcium reabsorption, and renal synthesis of calcitriol (1,25-dihydroxyvitamin D, the most active metabolite of vitamin D).*

*Among all causes o hypercalcemia,(* ***hyperparathyroidism and malignancy*** *)are the most common, accounting for greater than 90 percent of cases .* ***Causes of hypercalcemia***

*1.PTH-mediated*

 *Primary hyperparathyroidism (sporadic)*

 *Familial*

 *Tertiary hyperparathyroidism (renal failure)*

*2.PTH-independent*

 *Hypercalcemia of malignancy*

 *Vitamin D intoxication*

 *Chronic granulomatous disease*

 *-(Activation of extrarenal 1 alpha-hydroxylase (increased calcitriol)*

 *Medications :Thiazide,lithium,teriparatide,excessive vitamin A ,Theophyline toxicity*

***Miscellaneous*** *:hyperthyrodism,acromegaly,pheochromocytoma,adrenal insufficiency,immobilization,parantral nutrition,milk alkali syndrom*

***Clinical feature***

*Patients with mild hypercalcemia (calcium <12 mg/dl [3 mmol/L]) may be asymptomatic, or they may report nonspecific symptoms, such as constipation, fatigue, and depression. A serum calcium of 12 to 14 mg/dL (3 to 3.5 mmol/L) may be well-tolerated chronically, while an acute rise to these concentrations may cause marked symptoms, including polyuria, polydipsia, dehydration, anorexia, nausea, muscle weakness, and changes in sensorium. In patients with severe hypercalcemia (calcium >14 mg/dL [3.5 mmol/L]), there is often progression of these symptoms*

*clinical manifestations of hypercalcemia*

***renal:polyuria,polydipsia,nephrolithiasis,nephrocalcinosis,distal renal tubuler acidosis,nephrogenic diabetes insipidus.***

***Gastrointestinal***

*Anorexia, nausea, vomiting ,pancreatitis,peptic ulcer*

*Bowel hypomotility and constipation*

***Musculoskeletal***

*Muscle weakness ,bone pain,oseoporosis,*

***Neurologic***

*Decreased concentration ,confusion,fatigue,coma*

***Cardiovascular***

*Shortening of the QT interval , Bradycardia , Hypertension .*

***Treatment***

***Intervention mode of action***

*1.i.v saline solution -increase intravascular volume*

 *-increase calcium excretion*

*2.loo diuretics -increase calcium renal excreation*

*3.calcitonin -promot calcium excretion*

 *-decrease bone resorption*

*4.Bisphosphonates -inhibit bone resortion*

*5.corticosteroids - -decrease intestinal calcium absorption*

 *-decrease 1,25hydroxyvitamin D BY*

 *Mononuclear cells of lymphoma*

*6.Gallium nitrate -inhibit osteoclast bone resorption*

*7.calcimimetics -calcium sensing resptor agonist,reduce*

 *PTH production*

*8.Dialysis -Haemodialysis*