

Hypocalcemia

2002/01(制定)

2007/01(修)

Definition:

total serum calcium < 8mg/dl in full term

< 7mg/dl in preterm

ionized calcium < 3-3.5 mg/dl

Etiology

Early onset (during the first 3 days)

Preterm infants

Infants of diabetic mothers

? In utero exposure to anticonvulsants

? Phototherapy

Late onset (at the end of the 1st weeks of life)

High dietary phosphate load

Intestinal calcium malabsorption

Hypoparathyroidism

Idiopathic, transient

Congenital eg. DiGeorge sequence

Maternal hyperparathyroidism

Magnesium deficiency

Vitamin D deficiency

Maternal vitamin D deficiency

Maternal anticonvulsant therapy

Renal insufficiency

Hepatobiliary disease

Miscellaneous

Exchange blood transfusion (CPD)

Increased free fatty acid (intravenous lipid infusions)

Alkalosis

Hyperphosphatemia

Hypoalbuminemia

Furosemide

Shock or sepsis

? in utero exposure to narcotics

Clinical manifestations

Asymptomatic

Tremulousness, apnea, cyanosis, seizures

Convulsions

Lethargy, feeding poorly, vomiting, abdominal distension

Diagnostic workup

History

Familial

Pregnancy (illness, drug, gestation, birth asphyxia)

Infant's dietary intake

Physical examination

Jitteriness

Seizures

Associated features (IDM, premature, birth asphyxia)

Laboratory investigations

Serum Ca, Mg, P iCa, glucose

Vitamin D metabolite

PTH

Calcitonin

Acid-base

ECG (Q-Tc > 0.4 sec or Q0-Tc > 0.2 sec)

CXR (thymic shadow, aortic arch position)

Urine drug screen

Other: malabsorption workup, maternal/family screening

Treatment

Low phosphate diet

Intravenous 10% Ca gluconate 2ml/kg IVD > 10min

Nt : bradycardia, hypercalcemia, extravasation.

Oral 75-100 mg/k element calcium

50% MgSO₄ 0.05-0.1ml/k (0.1-0.2mmole/kg)

Oral 0.2ml/k (max 1.2ml/k in malabsorption syndrome)

Nt : oral type are not well-absorbed and large dosage. May cause diarrhea

1,25(OH)₂D₃ 0.05-0.2ug/K/D

Common calcium preparations

preparation	Elemental calcium content(mg)
Ca gluconate(10% inj)	9.0mg/ml
Ca Carbonate(500mg)	200mg/tab

Mineral contents of infant diets

Type of milk	Ca(mg/l)	P(mg/L)
Human milk	340	160
Similac Pm 60/40	380	190
SMA	425	290
Similac	510	390
Enfamil	470	320
Isomil	710	510
Prosobee	635	500
Similac special care 24	1460	730
Enfamil premature 24	1340	670