

Post Parturient Haemoglobinuria (PPH)

Introduction

Synonym:-

Hypophosphataemia, Metabolic or Nutritional Haemoglobinuria

Definition:-

It is a metabolic disease of high producing dairy cows and buffaloes, characterized by intravascular haemolysis, haemoglobinuria and anaemia.

Etiology

Def. of P in diet:-

- ✓ Soil def. in P
- ✓ Hay, straws & plant rich in oxalate are naturally deficient in P
- ✓ Drought, reduces P content in forage

Impaired absorption of P:-

- ✓ Excess Ca, Al & Fe in diet
- ✓ Vit. D def.
- ✓ Improper Ca:P ratio

Increased req. of P:-

- ✓ Heavy loss through milk

Etiology

Due to ingestion of some plants:-

- ✓ Feeding cruciferous plants like cabbage, turnip, kales, rape, rye, alpha alpha e.t.c.
- Kale contain thiocyanate, nitrates & sulphoxides
- Cabbage contain thiouracil, form Heinz body in RBC.
- ✓ Forage low in Cu, Se & Mo
- ✓ Plant rich in saponin, oxalate e.t.c.
- Saponin is a surface tension reducing agent that results in increased fragility of RBC & haemolysis

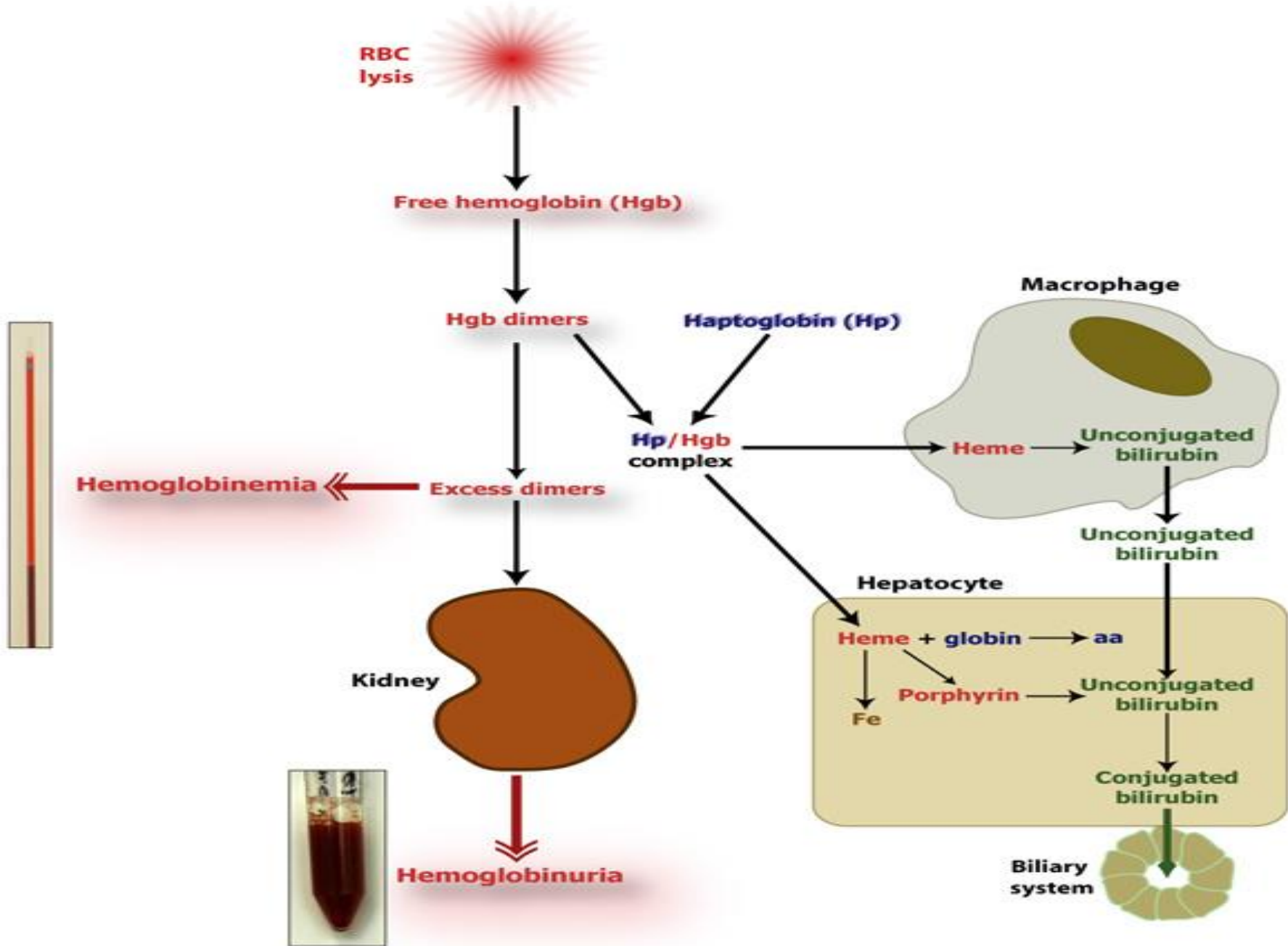
Epidemiology

- Maharashtra, Haryana, Punjab, Gujarat & U.P.
- Cattle & Buffaloes, Buffaloes are more susceptible than Cattle
- More common during 3rd – 6th lactation & 5-10 years of age.
- Mostly occur between 2-4 weeks after calving
- Advance pregnant Buffaloes are affected
- Heavy milker are more prone

Pathogenesis

The cause of intravascular haemolysis of erythrocytes is "unexplained", but may be attributed to:-

- Def. of P results in decrease in RBC glycolysis and ATP synthesis. Subnormal concentration of ATP predispose RBC to altered function & structure, so results in increased fragility & haemolysis
- Increased fragility of RBC due to inadequacy of phosphorus due to loss of integrity of phospholipids membrane of erythrocytes.
- Red cells which containing these Heinz-bodies are removed by spleen for haemolysis.



Clinical signs

- The animal voiding "dark red-brown" to almost "black" urine.
- Milk is yellowish or reddish in colour
- The animal eat and milk normally for 24 hours after the appearance of haemoglobinuria.
- Pale m.m., or even ecteric m.m. in severe cases (due to haemolytic jaundice).
- Tachycardia, increased pulse and respiration rates above normal ranges, dyspnoea.
- Normal/subnormal/slightly elevated rectal temperature.
- The extremities and teats are cold to touch
- Passage of pasty faeces with straining
- Yellow staining of the conjunctival and vulvar m.m. in severe cases of hypophosphatemia
- The disease slowly recovered, as convalescence is prolonged for up to 3-4 weeks (chronic cases) and pica is often observed during this stage
- Ketosis commonly occur co-incidently
- Death occur due to anaemic anoxia

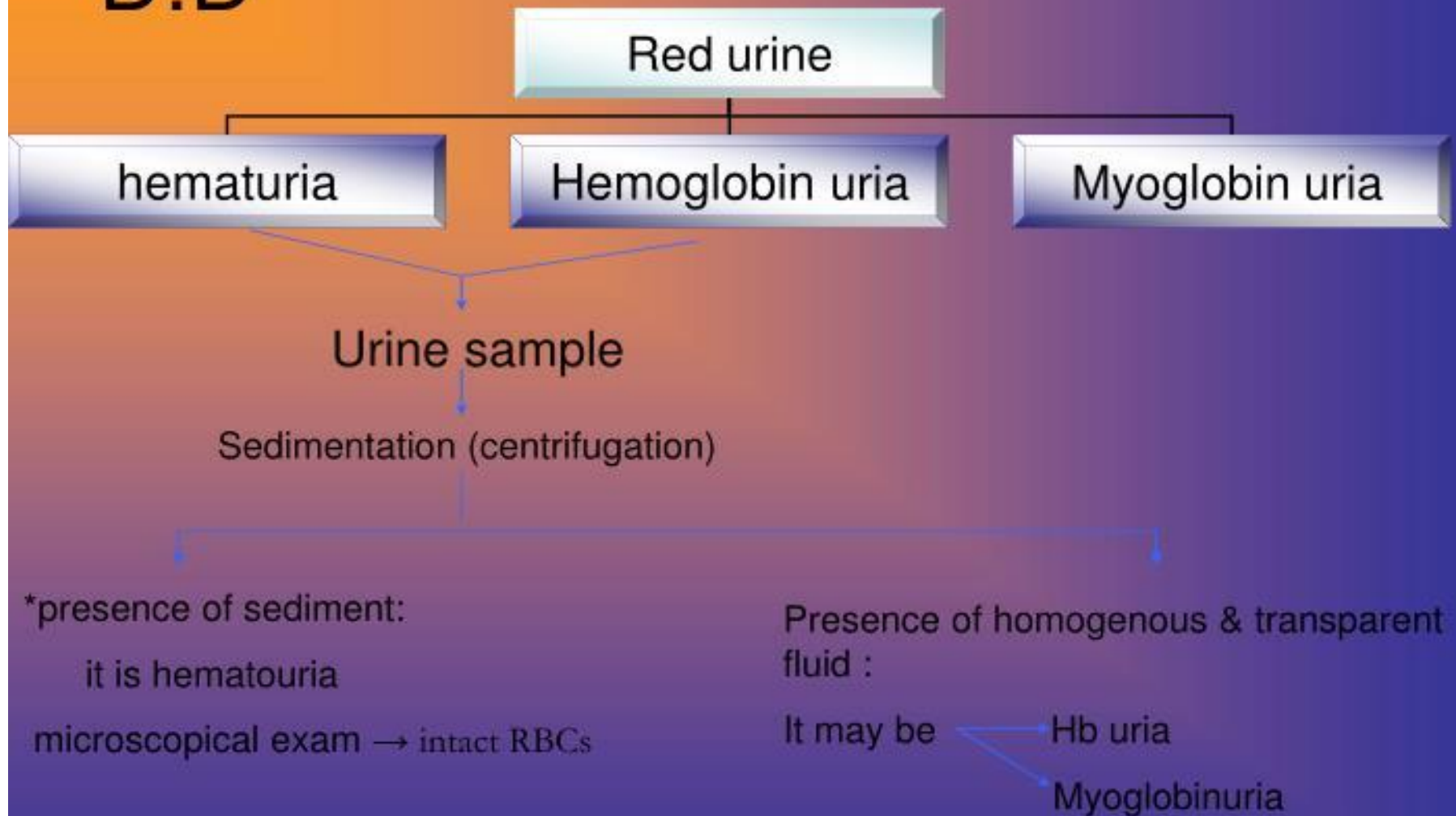
Clinical Pathology

- Serum level of P 0.5-1.5mg/dl(Normal 4-7mg/dl)
- Haemoglobin drop to 6-8 gm% (Normal 10-12 gm%)
- TEC drop to 2-3 millions/cumm of blood (Normal 5-8 millions /cumm of blood)
- PCV drop to 2.5-15 (N= about 35)
- Serum bilirubin and BUN raised.
- Low Cu level of blood

Diagnosis

- (I) History (II) Clinical signs(III) Laboratory diagnosis
- Quick response to replacement therapy of P
- Enlargement of liver & spleen
- Differential diagnosis:-
 - Babesiosis
 - Leptospirosis
 - Bacillary haemoglobinuria(*Clostridium haemolyticum*)

D.D



-If presence of homogenous & transparent fluid :
you may take serum sample & see its color :

*if it is of pink color → Hb uria

*if it is of clear color → Myoglobin uria

**Hb uria (caused by)

1- Babesia → -tick infestation

-young age more susceptible

-profuse diarrhea (pipe steam diarrhea) ,
then constipation

-M.M → congested → pale → jundice

-blood film → parasite

2-Bacillary Hb:

- sudden death (every 3 days)
- high fever
- sudden drop in milk yield
- blood stained feces
- necrosis in liver (p.m)
- most common with liver fluke infestation

&during summer

3-Leptospira:

adult

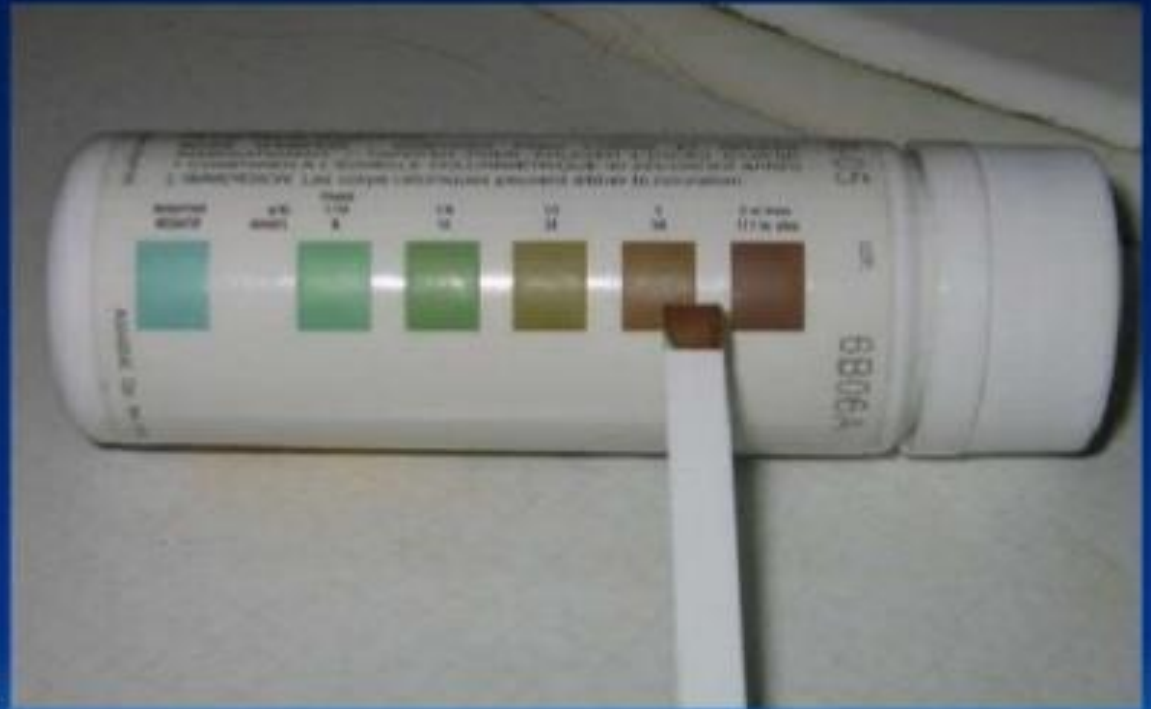
-calves & lambs are more susceptible than

- pyrexia (41-42°C) → abortion
- high mortality rate in calves & lambs
- bloody milk from all quarters
- the udder is soft & flappy



Yellow staining of the conjunctiva and valva MM in severe cases of hypophosphatemia.





- Urine strip Dipstick is positive for Hb

Treatment

- IV administration of 60 g of sodium acid phosphate in 300 ml of distilled water and a similar dose Sc, followed by further Sc injections at 12-hourly intervals on three occasions and similar daily doses by mouth for another 2 to 3 days.
- Blood transfusion in severe cases. A minimum of 5 L of blood to a 450 kg cow is recommended. This will usually suffice for up to 48 h by which time an additional transfusion may be necessary if the cow is weak and the mucous membranes pale.
- Fluid therapy for both supportive therapy and to minimize the danger of haemoglobinuric nephrosis
- Oral dosing with bone meal (120 g twice daily) or dicalcium phosphate or a suitable source of Ca & P daily for 5 days is recommended
- Haematinic like Feritas inj.
- Tonophosphan 10-15 ml I/V or I/M for 4-5 days
- Ascorbic acid(Vit. C) @15-20 mg/kg I/V daily for 3-4 days
- Liver extract with B complex

Prevention & Control

- Mineral mixture @30-40gm/animal/day
- Preparation containing Ca, P & Vit. D
- Protect recently calved & advance pregnant animals from cold stress

Thank you!

