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CASE REPORT

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HYPOCALCAEMIA AND ITS CONSEQUENCES DURING DELIVERY: A CASE REPORT NIDHI BAJPAI^{1*} ANURADHA ROY²

ABSTRACT:

Hypocalcaemia is defined as total serum calcium <8mg/dL (2mmol/L) or ionized calcium <4.4mg/dL (1.1mmol/L). Calcium is transferred from the maternal circulation to the foetal circulation by active transport from the placenta in the last trimester. This active transport increases from first trimester to the last trimester gradually. Present case report is of 23years old primigravidae patient with marriage life 11 months (non-consanguineous marriage) presented in the OPD of *Prasuti* tantra department, for the antenatal care. She received total antenatal care according to WHO recommendation and ayurvedic SOP of prenatal care from 20 weeks onwards. Due to borderline pelvis and non-progress of labour emergency LSCS was done. The baby gets suffered with right humorous bone fracture during extraction process. Later on, examination done for serum calcium and vitamin d3 reveals severe deficiency of both factors in neonate as well as in mother. So, it was planned to report present case to highlights the importance of calcium transport and vitamin d3 levels so that it can be become mandate for supplementation of additional vitamin d3 and monitoring of maternal levels during prenatal care to avoid these consequences. **Keywords**: Hypocalcaemia, *Praval bhasma*, Vitamin deficiency,

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INTRODUCTION

Hypocalcemia is defined as total serum calcium <8mg/dL(2mmol/L) or ionized calcium <4.4mg/dL (1.1mmol/L). According to the National Institute of Health the recommended daily calcium dietary allowance in normal females aged 19–50 years during pregnancy and lactation is 1000 mg and 1300 mg Calcium is respectively. essential for extracellular as well as intracellular functions includes which neuronal transmission. membrane stability, bone structure, blood coagulation, muscle movement, and intracellular signaling. It is also an important cofactor for hormonal secretion ⁽¹⁾. For optimal and normal functioning of these processes, the total serum calcium concentrations need to be normally maintained within the very narrow range of 8.5 and 10.5 mg/dL regulation.

The full-term neonate has about 30 g of calcium which is drawn during pregnancy from the maternal calcium stores to meet its needs for fetal skeletal mineralization and to maintain normal physiological processes across gestation. Calcium is transferred from the maternal circulation to the foetal circulation by active transport from the placenta in the last trimester. This active increases from transport only several milligrams per day in the first trimester to > 250 mg/d during the last trimester. Insufficient maternal vitamin D supplementation predisposes to natal reactive hyperparathyroidism which may lead to intracranial bleeding and neonatal rickets with intrauterine fractures.

A previous longitudinal study shows that in pregnancy urinary calcium losses increased but increased maternal calcium absorption from gut provide the adequate calcium for foetal bone development. Bone density start to increase as early as 10 weeks gestational age and is mainly increased towards the end of gestation. Women are at risk when they already have hypocalcaemia and must undergo a strain on their bodies to meet additional needs of calcium during pregnancy and lactation.

The present case report developed to address that in spite of regular intake of calcium supplements during pregnancy, the calcium level was very low in maternal and foetal blood.And later onit predisposes the foetus to fracture during normal process of delivery.

Case summary

A 23years old primigravidae patient with marriage life 11 months (nonconsanguineous marriage) presented in the OPD,for the antenatal care. Her first visit was after 1st trimester with gestational age of 19 weeks3 days by her ultrasound reports. The LMP was 3.08.2021with regular menstrual cycle.No history of past medical treatment or any chronic disease. No history of TB/Diabetes mellitus/Thyroid inadequacy. No history of any radiation exposure during this pregnancy. No history of any congenital anomaly in or any other hereditary diseases in family. of normal foetal movement with no history of any white discharge per vaginum or leaking,no history of itching, breathlessness and pain. she was taken regular antenatal visits after that as advised.

Investigations

On examination general condition of the patient was fair, vitals stable. Her perception

СВС	08-02-2022	23-04-2022	10-05-2022	
Hb	9.90 gm/dl	10.10 gm/dl	9.30 gm/dl	
TLC	14.15	11.06	14.79	
RBCs	3.93	4.04	3.56	
Platelets	214	209	152	

Table 1: Haematological investigations

Table 2: Radiological investigation

Ultrasound	3-10-2021	26-12-2021	1-05-2022
	Single live intrauterine	GA-19 weeks 3 days	GA-36 weeks
	gestational sac	Cephalic presentation	Cephalic
	CRL-19.2mm	Liquor adequate	EFBW-2674 gm
	GA 8weeks 3days	Placenta posterior,	AFI- 17cm
	Foetal pole seen with	grade 2,not low lying	BPP 10/10
	good cardiac activity	No any gross congenital	No cord around
		anomaly	neck
			No gross
			congenital
			anomaly

Other investigations- Rest of the investigations were within normal limit.

Patient was given ayurvedic line of antenatal care according to SOP of antenatal care ⁽²⁾.

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Formulations	Dose	Dosage	Duration
Tab Folic acid	5 mg	OD	From 1 st visit onwards
Dhatrilauha	250 mg	BD	From 1 st visit onwards
Praval bhasma	250 mg	BD	From 1 st visit onwards
Dadima ghrita	10 gm	BD	From 1 st visit onwards

Table 3: Treatment protocol

Outcome-During cesarion section the extraction of baby head was uneventful but while delivery of trunk the humerus bone got fractured (Fig.1). Baby cried well immediately



Fig. 1- X-ray plate of Right humorous

after birth. On placental examination it showed higher degree of calcified region(Fig.2).



Fig.2- Foetal surface of placenta showing

calcified regions

Investigations	Mother	Baby
Sr. Calcium	7.88 mg/dl	9.50 mg/dl
Vit.D3	11.37 nmol/L (Severely reduced)	7.50 nmol/L

Table 4: Post fracture investigations

DISCUSSION

Vitamin D plays a major part in the transport of calcium by the syncytiotrophoblast cell and a calcium-binding protein, which depends on the level of vitamin D. So it is possible that these factors involved in the calcium transport ⁽³⁾.Astudy in the pregnant rat, established that 1,25(OH)2D is a critical factor in the maintenance of sufficient maternal calcium for transport to the foetus and may play a role in normal skeletal development of the neonate ⁽⁴⁾.

The maternal dietary and life style practices and intrauterine growth should also be considered for prevention against osteoporotic fracture ⁽⁵⁾. The control of placental transfer of calcium is probably on the foetal side of the placenta. The syncytiotrophoblast layer of the placenta is the major site of exchange of nutrients and gases between mother and foetus.

In present study *Praval bhasma* was used as calcium supplement which was previously proved by experiments that it is effective in the prevention of calcium and oestrogen deficient bone loss and justify the continuing use of this ayurvedic preparation in traditional system of Indian medicine for management of bone metabolic disorders such as osteoporosis⁽⁶⁾.

In present case study patient was regularly given praval bhasma as calcium supplement in the recommended dose but may be due to absorption and transfer defects due to decreased availability of vit D3 as it is severely reduced in maternal plasma and also in foetusit may not become available to maternal and foetal circulation. On placental examination there was higher calcified regions which can be due to transfer defects of calcium from maternal circulation via syncytiotrophoblast towards the foetus. Due to absorption and transfer defects the foetus was remain deficient of calcium level which can predispose the foetus towards fracture.

Conclusion

The calcium content of the foetus increases as gestation period advances. The transfer of calcium from mother to child takes place via active mechanisms. In spite of regular calcium prescription, the absorption defects can predispose the mother and foetus towards adverse outcome. So, it can be concluded that during regular ANC workup, assessment of serum calcium and vitamin D should must in third trimester and recommended dose of vitamin D3 should also be added in ANC protocol.

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