ORIGINAL RESEARCH PAPER

Paediatrics

# MATERNAL BETA BLOCKER EXPOSURE AND NEONATAL HYPOGLYCEMIA

**KEY WORDS:** propranolol, breastfeeding, hypoglycemia.

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**ABSTRACT**

Beta blockers are widely used in the treatment of multiple conditions during pregnancy, such as hypertension, hypertrophic obstructive cardiomyopathy, mitral stenosis and fetal tachycardia. These drugs, most commonly used propranolol, are also used in maternal hyperthyroidism to abort the beta-adrenergic activity. Overall, approximately 5–10% fetuses exposed to beta blockers have risk of neonatal hypoglycemia. **SUMMARY:** A mother who was on propranolol treatment gave birth to a full term,growth restricted female neonate. It was noticed that the baby had repeated episodes of hypoglycemia on breastfeeding, which required high glucose infusion rates. Subsequent to ruling out the common causes of hypoglycemia, the same was attributed to maternal propranolol intake. Hence, breastfeeding was withheld and commercial formula top feeds were provided to the baby. Following this change, hypoglycemia was gradually corrected and the baby maintained a euglycemic state. Thus, we report this case of neonatal hypoglycemia secondary to an exposure to maternal beta blocker.

## CASE REPORT

A second gravida pregnant lady with a normal and healthy first-born child was admitted to an antenatal ward. She was detected with hypothyroidism during her first pregnancy and was taking propylthiouracil. The next year, following a hyperthyroid storm, she was prescribed propranolol on a continuous basis. Her second pregnancy was uneventful. However, an antenatal USG suggested intrauterine growth restriction with normal anomaly scan.She delivered vaginally a full term female baby. The baby cried at birth, weighed 1.9 kg, and had features of intra uterine growth restriction (IUGR), but no gross congenital anomaly was noticed. The neonate was shifted to the NICU in view of IUGR and low birth weight. On Day 1, the baby was started on formula feeds and was euglycemic. On Day 2 baby was started on breast milk along with top feeds. Multiple readings of asymptomatic hypoglycemia were observed requiring continuous glucose infusion drip at high rate.On intravenous glucose infusion drip, the sugar levels were within the normal limits.

On reinitiating breast feeding, the baby again had hypoglycemia. Septic and critical sampling were done and the results were negative. Breast milk was withheld and the baby was started on top feeds in view of the breastmilk containing propranolol induced hypoglycemia. Hypoglycemia was not noted and the baby continued on top feeds. Serum and breastmilk propranolol levels could not be tested due to the resource-limited set-up and as the parents could not afford the same.The baby was discharged on top feeds and supplements, and mother continued her medication.During the follow-up, the baby was stable, had gained weight,and was feeding on top feeds.

## DISCUSSION

Propranolol is a non-selective beta blocker. It is used in thyrotoxicosis to abort the symptoms caused by increased beta adrenergic activity. Propranolol decreases triiodothyronine (T3) levels by inhibiting 5'-monodeiodinase, which converts thyroxine (T4) to T3. The use of propranolol in pregnancy is controversial as it has adverse effects on fetus (Davis et al., 2011). It inhibits the placental perfusion, thereby compromising fetal growth. It is noticed that neonates exposed to propranolol can result in adverse outcomes leading to pulmonary, neurological, and cardiovascular complications (Davis et al., 2011).

Similar to the current case report, Bateman et al.(2016) also found that newborns exposed to maternal propranolol may have prematurity, growth restriction, and hypoglycemia. In concurrence with previous studies, we found that maternal propranolol intake was the likely cause of neonatal hypoglycemia. As such, routine blood glucose monitoring in babies born to mothers using beta blockers should be considered (Committee on Fetus and Newborn, 2011).

## CONCLUSION

A risk benefit analysis for the use of propranolol during pregnancy and lactation should be considered. Careful monitoring of adverse effects on neonate secondary to maternal propranolol therapy is needed in order to be promptly treated.

## REFERENCES

1. Bateman, B. T., Patorno, E., Desai, R.J., Seely, E.W., Mogun, H., Maeda, A., Fischer, M.A., Hernandez-Diaz, S.,& Huybrechts, K.F. (2016).Late pregnancy beta blocker exposure and risks of neonatal hypoglycemia and bradycardia.*Pediatrics*, *138*(3), e20160731.https://doi.org/10.1542/peds.2016-0731
2. Committee on Fetus and Newborn. (2011).Postnatal glucose homeostasis in late-preterm and term infants.*Pediatrics*, *127*(3), 575–579.https://doi.org/10.1542/peds.2010-3851
3. Davis, R. L.,Eastman, D.,McPhillips, H., Raebel, M.A., Andrade, S.E., Smith, D., Yood, M.U., Dublin, S.,& Platt, R. (2011).Risks of congenital malformations and perinatal events among infants exposed to calcium channel and beta blockers in pregnancy.*Pharmocoepidemiology and Drug Staff*,*20*(2), 138–145. https://doi.org/10.1002/pds.2068
4. Kuklina, E.V., Ayala, C., &Callaghan, W.M. (2009).Hypertensive disorders and severe obstetric morbidity in United States.*Obstetrics & Gynecology*, *113*(6), 1299–1306.https://doi.org/10.1097/aog.0b013e3181a45b25