Brain-Derived Neurotrophic Factor: A Promising Biomarker for Predicting Prematurity-Related Complications

Sir,

Premature birth is associated with a higher risk for developing complications in various organs, which consequently can increase the risk of morbidity and mortality of these infants. Intraventricular hemorrhage (IVH), retinopathy of prematurity (ROP), and disorders of the developing nervous system are among the most significant prematurity-related complications. Using predictors to recognize premature infants with a high risk of developing these complications and managing them with proper prophylactic interventions will significantly reduce the associated morbidity, mortality, and costs.[1,2]

Recently, some attention has focused on the association between the brain-derived neurotrophic factor (BDNF) level, which is a protein from the growth factors family and prematurity-related complication. BDNF plays significant roles in the prenatal and postnatal brain growth and development.[3,4] Blood BDNF level can reflect structural maturity of the nervous system among premature infants. BDNF has been demonstrated to decrease tissue loss in the brain when administered after hypoxic-ischemic brain injury in neonatal rats.[4,5] In addition, the BDNF presence in the retina and its roles in angiogenesis demonstrate its probable roles in ROP.[1,3] A study showed premature infants who suffered from ROP had significantly lower BDNF levels compared with other premature infants.[1] Another study reported the association of BDNF gene variants with severe ROP.[3] Additionally, it has been revealed an association between BDNF level and the occurrence of IVH among premature infants. The cord blood level of BDNF among infants with IVH was significantly lower than healthy infants.[5]

According to the current literature, it seems that lower serum BDNF levels can be considered as a potential etiologic factor for the occurrence of prematurity-related complications, which appear to warrant further investigations to confirm or disprove this hypothesis. In addition, further long-term studies are required to assess the potential role of blood BDNF levels, as a biomarker for predicting prematurity-related complications. Additionally, future studies are needed to evaluate whether an increase in local or systemic BDNF production by the use of co-factors such as vitamin B12 or dexamethasone can influence developing prematurity-related complications or not. Furthermore, considering the role of maternal lifestyle characteristics on BDNF levels in neonates,[6] this issue should also be investigated in more detail in premature neonate and its potential role in the occurrence of prematurity-related complications.

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Conflicts of interest

There are no conflicts of interest.

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