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## High Mobility Group Box 1 in Preterm Infants with Intraventricular Hemorrhage

We studied the level of high mobility group box 1 (HMGB1) in preterm infants with intraventricular hemorrhage (IVH). Using enzyme-linked immunosorbent assay (ELISA), the concentration of HMGB1 in cord blood obtained from 41 infants with IVH and 67 infants without IVH were measured. The cord blood concentration of HMGB1 in infants with IVH were significantly higher than those without IVH ( $P=0.041$ ). Increased levels of HMGB1 might be associated with IVH in preterm infants.

**Keywords:** HMGB1, Intraventricular Hemorrhage, Prematurity.

Intraventricular hemorrhage (IVH) often occurs in premature infants and results in increased morbidity and mortality in survivors [1]. Intrauterine infection may predispose to IVH through inflammation [2]. In this pathophysiological process, many pro-inflammatory cytokines such as High mobility group box 1 (HMGB1) may be involved. We conducted this study to explore relationship between HMGB1 and IVH in preterm infants.

All infants enrolled in this study were delivered less than 32 weeks of gestation and treated in the neonatal intensive care unit (NICU) of the First Affiliated Hospital, College of Medicine, Zhejiang University, China, between April 2012 and July 2014. Umbilical venous blood was obtained from all infants immediately after birth, and centrifuged at 2000 rpm for 10 min. The serum was separated and stored at  $-70^{\circ}\text{C}$  before analysis. HMGB1 was measured with commercially available ELISA kits (Shino-Test, Kanagawa, Japan) according to the manufacturer's recommendations.

The clinical data were collected from the infants' records. Diagnosis of IVH was made by cranial ultrasonography. IVH was classified in four grades [3]. Written informed consent was obtained from one of the parents. The study was approved by the ethics committee of the Affiliated Hospital of Jiangsu University.

Forty-one infants with IVH and 67 infants without IVH were enrolled in this study. Of the 41 infants with IVH, 21 had grade I, 12 had grade II, 6 had grade III, and 2 had IV IVH. Other characteristics of the participants are shown in **Table I**. There were no significant differences in baseline characteristics between the two groups.

The levels of HMGB1 were 108.6 (37.3, 400.9)  $\mu\text{g/L}$  in infants with IVH, and 61.5 (26.8, 508.3)  $\mu\text{g/L}$  in infants without IVH. As shown in **Fig. 1**, the levels of HMGB1 in infants with IVH were significantly higher than in those without IVH ( $P=0.041$ ). There was no significant difference of HMGB1 levels among infants with different grades of IVH.

In recent years, HMGB1 has been proposed as a late mediator during inflammation [4]. Some researches

**TABLE I** CHARACTERISTICS OF PARTICIPANTS IN THE STUDY

	Intraventricular hemorrhage		P value
	Present (n=41)	Absent (n=67)	
Gestational age (wk)	30.6 (1.37)	30.3 (1.15)	0.656
Birth weight (g)	1647 (207)	1671 (187)	0.813
Male	25	39	0.776
Cesarean birth	31	40	0.091
1 min Apgar	8 (5-8)	9 (5-9)	0.882
5 min Apgar	9 (5-9)	9 (6-9)	0.892

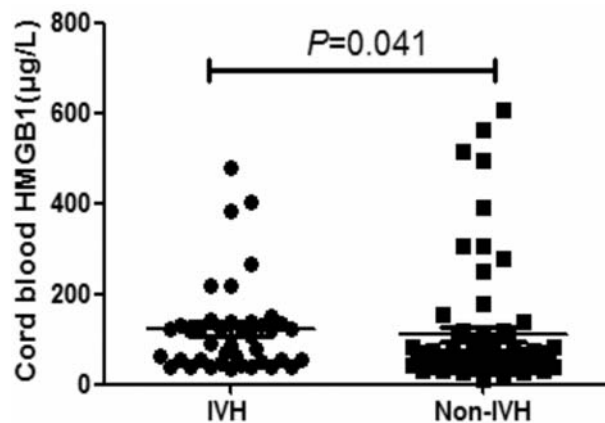


Fig. 1 Serum HMGB1 levels in neonates with and without IVH.

demonstrated that HMGB1 could play a critical role in inflammatory diseases, such as tissue injury or sepsis [5]. However, the role of HMGB1 in IVH is not exactly known. Our data suggest that HMGB1 might be involved in the pathophysiology of IVH in preterm infants.

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JIANGLIN MA AND <sup>#</sup>HONGYAN LU

Department of Pediatrics,  
The First Affiliated Hospital,  
College of Medicine, Zhejiang University, Hangzhou,  
and <sup>#</sup>Department of Pediatrics, The Affiliated Hospital of  
Jiangsu University, Zhenjiang, Jiangsu; China.  
\*494462648@qq.com

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