AAP DISTRICT VIII SECTION ON NEONATAL PERINATAL MEDICINE

2021 ANNUAL CONFERENCE **ORIGINAL RESEARCH** (BASIC SCIENCE or CLINICAL)
ABSTRACT SUBMISSION FORM

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DEADLINE FOR RECEIPT OF ABSTRACT IS FEBRUARY 19, 2021. Submissions will be accepted for either poster or oral presentation. Authors will be notified of acceptance and format for presentation (poster or poster symposium) by **March 12, 2021.**

Title: **Association of oxygen saturation instability in relation to white matter injury (WMI) in** preterm neonate: Application of a new classification system.

Authors: Agarwal G, Chan NHM, Synnes AR, Chau CMY, Grunau RE, Miller SP, Solimano A.

Institution: Department of Pediatrics, University of British Columbia, Vancouver BC, Canada.

Background: Very preterm neonates undergo spells of oxygen saturation (Spo2) instability with more than 100 hypoxemic episodes every day in the first 2 months of postnatal life. The impact of this oxygenation instability on neonatal brain maturation is uncertain despite the potential contribution to poorer neurodevelopment.

Methods. This observational study was conducted on very preterm infants (N=84) born 24-32 weeks gestational age (GA) enrolled in a larger prospective longitudinal cohort project. Clinical variables and daily 12 hourly histograms of Spo2 levels were recorded during the NICU stay. Histogram data was collected until time of first MR scan and then grouped into 3 categories: stable (type 1, 2), intermediate (type 3) and unstable (type 4, 5). MR was classified as with or without white matter injury (WMI). Sample characteristics between 2 groups (with or without WMI) were analyzed using independent “t test” for continuous variables and Chi square ($\chi 2$) test for categorical variables. Binary logistic regression was used to model the association between Spo2 instability and WMI.

Results: 81 of 84 neonates in this cohort had adequate histogram data for analysis with a mean gestational age =27.98 ± 1.99 weeks, birth weight = 1141.62 ± 337.06 g. 30/81 babies (37%) had a WMI on first postnatal MR imaging (median GA =33 wks.). There was a statistical significant (*P<0.001) difference in mean Spo2 instability (% of unstable histograms) in WMI group (12.5%) compared to no WMI group (3.1%). It remained independently significant (*P <0.008) after controlling for other important confounding factors on logistic regression model.

Conclusion: A higher proportion of time spent with unstable histogram pattern is strongly associated with WMI in preterm neonates.

Table 1: Sample characteristics

Variables	no WMI (n = 51)	WMI (n=30)	P Value
Gestational age, mean (SD), weeks	27.94 (1.99)	28.06 (2.03)	0.78
Birth weight, mean (SD), g.	1133.51 (334.02)	1155.40 (347.46)	0.78
Male sex, n	26	20	0.16
Vaginal delivery, n	14	11	0.38
Antenatal steroids, n	45	21	0.08
SGA , n	6	5	0.75
Neonatal infection, n	1	5	* 0.01
**SNAP II score day 1, mean (SD)	8.82 (10.65)	11.80 (13.44)	0.27
Total days of invasive ventilation before MRI	4.01 (9.16)	7.33(11.70)	0.16
Severe IVH**, n (%)	1	1	0.19

*Denotes significance at p <0.05

**SGA- small for gestational age, SNAP II- Score for neonatal acute physiology II, IVH – intraventricular hemorrhage.

Fig .1 Whisker and box plot demonstrating the difference in spo2 instability (% unstable Histograms) between the WMI and no WMI groups.

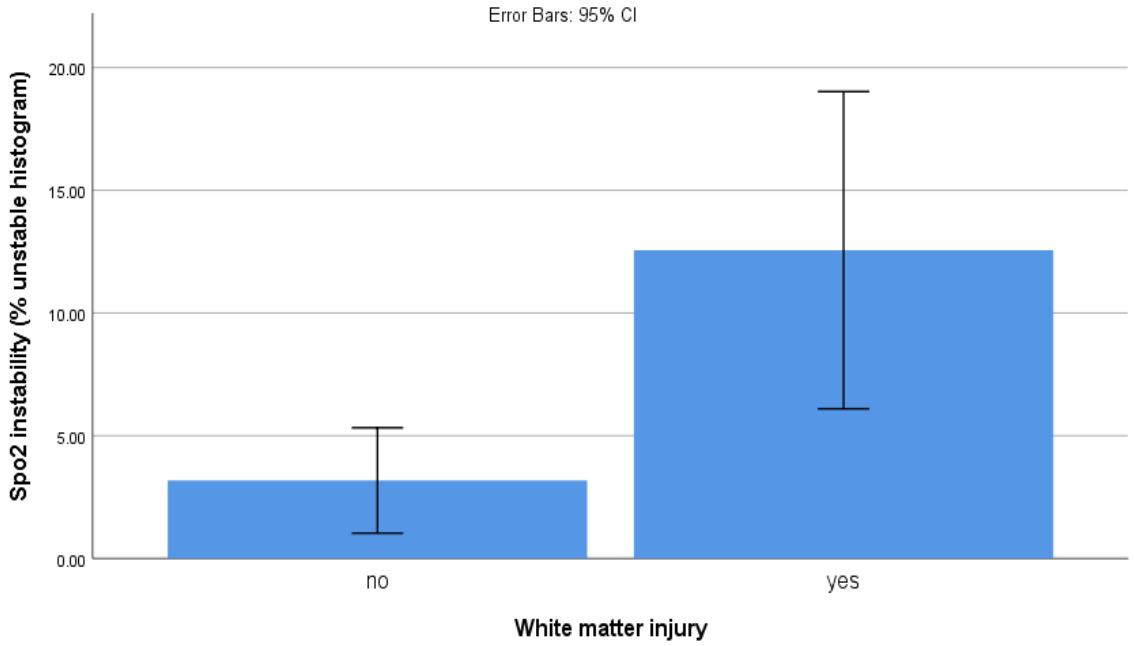

Table 2: Logistic regression, Spo2 instability and WMI

VARIABLES	B	S.E.	P value	EXP(B)
Gestational age	0.257	0.245	0.294	1.293
Birth Weight	0.001	0.001	0.696	1.001
SNAP II Day 1	0.015	0.024	0.550	1.015
SGA	-0.203	0.819	0.804	0.816
Antenatal Steroids	0.006	0.016	0.705	1.006
Neonatal Infection	1.759	1.365	0.197	5.808
Total days of invasive ventilation before MRI	-0.029	0.040	0.464	0.971
Spo2 instability (% Unstable Histogram)	0.088	0.033	*0.008	1.092

*Denotes significance at p <0.05