

## Background

- According to CDC and APA recommendation all infants born to mothers with clinical chorioamnionitis need to be evaluated for sepsis and treated with antibiotics
- NICHD (January 2015) published new evidence-based guidelines for the diagnosis and management of pregnant women with what had been commonly called “chorioamnionitis”
- ACOG Committee Opinion Summary (August 2017): Additionally recommends that a single episode of temperature of 39.0 °C (102.2 °F) be placed in the ‘suspected intraamniotic infection’ category to maximize sensitivity, even without other diagnostic criteria

## Study Design

- Retrospective cohort of women who delivered ≥35 weeks gestation between 2/2011 - 3/2017 and were diagnosed with clinical chorioamnionitis
- Cohort was reclassified using the Triple I by NICHD criteria and subsequently by ACOG criteria
- Primary outcome: incidence of suspected and confirmed Triple I
- Secondary outcome: Incidence of clinical illness and positive culture in neonates. NICHD criteria was compared with the ACOG criteria.

## Results

- 10,923 deliveries during the study period
- 807 women (7.4%) diagnosed with chorioamnionitis
- Maternal data were available in 742 (92%)
- Maternal demographics in Table 1 were not significantly different except by BMI, use of antipyretics and antibiotics in labor only
- Suspected Triple I by NICHD criteria was identified in 335 (45.1%) of women, among them 266/335 (79.4%) had confirmation by histology. Using ACOG criteria 7 additional women were considered suspected Triple I
- Clinical signs suggestive of neonatal sepsis were identified in 132 (17.7%) infants (Table 2)
- Only 3 infants (0.4%) had culture positive sepsis and they were born to one mother with isolated fever and 2 with suspected and confirmed Triple I by NICHD criteria, but all 3 meet Triple I criteria by ACOG
- 61 women (8.2%) had maternal fever ≥ 39.0° (102.1 °F)
  - 38 (62.3%) had at least another episode of fever between 38.0°-38.9°
  - 54 (88.5%) meet criteria for suspected Triple I
  - 51 (83.61%) had confirmation by pathology including 29 (47.54%) with funisitis

## Results

Table 1. Maternal characteristics, classification by NICHD criteria

	Do not meet criteria for Isolated Fever n=290 (39.20%)	Met Criteria for Fever n=452 (60.80%)		Confirmed Triple I n=266/335 (79.4%)
		Isolated Fever n=117 (15.60%)	Suspected Triple I n=335 (45.10%)	
Maternal Age (years)	27.5±5.8	27.72±5.7	27.58±5.8	27.58±5.8
African American	131 (45.17)	49 (41.88)	129 (38.51)	102 (38.35)
Nulliparity	230 (79.31)	86 (73.50)	262 (78.21)	206 (77.44)
BMI > 30	77 (26.55)	33 (28.21)	116 (34.63)**	90 (33.83)
GBS Positive	78 (26.90)	33 (28.21)	68 (20.30)	51 (19.17)
ROM > 18 hours	84 (28.97)	30 (25.64)	102 (30.45)	81 (30.45)
GA at Delivery	39.56±1.38	39.53±1.3	39.67±1.24	39.77±1.23
PTB < 37 weeks	8 (2.76)	7 (5.98)	7 (2.09)	4 (1.50)
Cesarean section	101 (34.83)	40 (34.19)	130 (38.81)	110 (41.35)
Epidural in labor	287 (98.97)	116 (99.15)	331 (98.81)	261 (98.12)
Prostaglandin	76 (26.21)	33 (28.21)	76 (22.69)	51 (19.17)
Antipyretic	239 (82.41)	97 (82.91)	308 (91.94)**	242 (90.98)
Antibiotics before delivery	270 (93.10)	107 (91.45)	332 (99.10)^	264 (99.25)

Table 2. Neonatal outcomes, classification by NICHD criteria

	Do not meet criteria for Isolated Fever n=290 (39.1%)	Met Criteria for Fever n=452 (60.9%)		Confirmed Triple I n=266/335 (79.4%)
		Isolated Fever n=117 (15.8%)	Suspected Triple I n=335 (45.1%)	
GA (weeks)	39.56±1.38	39.53±1.3	39.67±1.24	39.77±1.23
BW (kg)	3.4±0.5	3.4±0.4	3.3±0.4	3.4±0.4
Apgar 5 minutes < 7	7 (2.41)	4 (3.42)	21 (6.27)**	20 (7.52)
Clinical Symptoms (%)	75 (25.9)	23 (19.8)	80 (23.9)	63 (23.7)
Abnormal IT ratio (%)	48 (16.5)	28 (23.9)	92 (27.5)*	78 (29.3)*
Abnormal CRP (%)	48 (16.5)	19 (16.2)	93 (27.8)**	82 (30.8)**
Lumbar Puncture (%)	31 (10.7)	13 (11.1)	69 (20.6)**	57 (21.4)**
Clinical sepsis (%)	33 (11.3)	15 (12.8)	84 (25.1)**	71 (26.7)**
Culture positive sepsis (%)	0 (0)	1 (0.8)	2 (0.6)	2 (0.7)
Duration of antibiotics (days)	2.6 ± 1.6	2.7 ± 1.9	3.3 ± 2.4**	3.4 ± 2.4**
Duration of NICU stay (days)	4.0 ± 4.5	3.9 ± 4.1	4.4 ± 3.9	4.6 ± 4.2

Data are presented as mean ± standard deviation or number (percentage). BMI: body mass index. GBS: Group B streptococcus. PTB: preterm birth; GA: gestational age, ROM: rupture of membranes, BW: Birth weight, NICU: Neonatal intensive unit. \*p<0.05 compared **not** met criteria for maternal fever vs Suspected “Triple I” ^p<0.05 comparing isolated fever vs Suspected “Triple I”

## Results

Table 3: Neonatal data of cases with confirmed sepsis by culture

Case #	Peak Maternal Temp	Met Fever criteria	Symptoms	Suspected Triple I NICHD/ACOG	Placenta	Confirmed Triple I
Case #1 Group B streptococcus	39.7°C (103.4°F)	Yes	No	Yes/Yes	Chorio/Funisitis	Yes
Case #2 Streptococcus sanguinis	39.0°C (101.2°F)	Yes	Yes	Yes/Yes	Chorio/Funisitis	Yes
Case #3 E. coli	39.3°C (102.7°F)	Yes	No	No/Yes	Not Sent	Unknown

## Conclusion

- By using the NICHD criteria for Triple I, only 45.1% of women previously diagnosed as clinical chorioamnionitis will meet criteria of suspected Triple I and will need antibiotics in labor.
- By ACOG recommendation, women with isolated fever ≥ 39.0° (102.2 °F) should be diagnosed with suspected “Triple I”, 54/61 (88.5%) of them meet criteria for suspected Triple I by NICHD criteria
- By ACOG criteria none of the neonatal cases of culture positive sepsis were missed
- The Triple I classification by ACOG criteria will reduce the NICU admission and antibiotic use by 54% without missing a case on neonatal sepsis