

Methods Thirty Wistar albino rat pups were randomly divided into 3 groups: group 1, control; group 2, NEC and saline; group 3, NEC and NAC treatment. NEC was induced by hyperosmolar enteral formula feeding and exposure to hypoxia after cold stress at 4°C and oxygen. The pups were killed on the fourth day and their intestinal tissues were harvested for biochemical and histopathologic analysis.

Results Mucosal injury scores and intestinal malondialdehyde levels in group 2 were found to be significantly higher than other groups ($p < 0.05$). Intestinal superoxide dismutase activities in group 3 were significantly higher than group 2 ($p = 0.018$). Intestinal tissue TNF- α levels were significantly reduced with NAC treatment in group 3 compared to group 2 ($p < 0.003$).

Conclusions It is more likely that oxidative stress and inflammatory mediators contributed to the pathogenesis of NEC and that NAC had a protective effect on intestinal injury through its anti-inflammatory and antioxidant properties.

280 ANALYSIS OF NEC INDUCING FACTORS OF PRETERM UNDER 1500G

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Background and Aim NEC (Necrotizing Enterocolitis) is Various degrees of mucosal or transmural necrosis of the intestine and the most common life-threatening emergency of the gastrointestinal tract in the newborn period. Recently, Transfusion is reported increased odds ratio of NEC after transfusion of red blood cells in premature infants.

We studied to investigate the relationship between the NEC inducing factors in preterm under 1500g and red blood cell transfusion.

Method We analyzed Preterm infants (n=180) under 1500g who were admitted at Kangnam CHA Hospital NICU from January 2006 to december 2009. Preterm infants (G.A:24+6 wk ~35+4wk, B.W 740 g ~1490 g) were grouped NEC group (n=18, \geq Stage 2b) and No-NEC group (n=162, < Stage 2b). NEC group was defined more stage 2b by modified Bell's criteria. No-NEC group was defined under stage 2b. Statistics analysis used t-test, cross-tab, logistic regression by SPSS 12.0.

Result NEC group (n=18, 27.61 \pm 2.15 wk, 1027.78 \pm 343.57 g) was significant in Apgar(1min)(3.33 \pm 1.5 vs 4.39 \pm 1.6, $p=0.01$), Apgar(5min)(5.67 \pm 1.64 vs 6.45 \pm 1.41, $p=0.03$) score and RDS (100% vs 80.9%, $p=0.04$) with No-NEC group (n=162, 28.96 \pm 2.98 wk, 1134.2 \pm 271.36 g). Transfusion was not significant between NEC group (89%) and No-NEC group (77%). By multivariate logistic regression, gestation age and ventilator duration was correlation with NEC. The odds ratio of transfusion was 1.211 (95%CI: 0.377~3.887, $p=0.748$) after adjustment of gestation age and Apgar score.

Abstract 280 Table 1 Clinical Characteristics of Preterm Infants

	NEC (n=18)	No-NEC (n=162)	P-value
B.W(g)	1027.78 \pm 343.57	1134.2 \pm 271.36	NS
G.A(wk)	27.61 \pm 2.15	28.96 \pm 2.98	NS
Male gender(n)	7 (38.89%)	77 (47.53%)	NS
Apgar(1min)	3.33 \pm 1.5	4.39 \pm 1.64	0.01
Apgar(5min)	5.67 \pm 1.64	6.45 \pm 1.41	0.03
PDA(n)	7 (38.89%)	47 (29.01%)	NS
RDS(n)	18 (100.0%)	131 (80.86%)	0.046
ventilator(d)	8.33 \pm 7.28	6.99 \pm 11.22	NS
Trasfusion(n)	16 (88.89%)	124 (76.54%)	NS

Conclusion Apgar score and RDS was significant correlation with NEC. Transfusion was not significant correlation with NEC.

281 PROTEIN C AND PROTEIN S IN THE DIAGNOSIS, MANAGEMENT AND PROGNOSIS OF PREMATURE INFANT WITH NECROTIZING ENTEROCOLITIS

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Objective In this prospective, observational study, we determined whether serum protein C and protein S (PC/PS) activity correlated with necrotizing enterocolitis (NEC) stages II and III in premature infant. We hypothesized that PC/PS measurement if used as an adjunct to abdominal radiographs would improve the identification and predication of infants with NEC.

Methods Serum PC/PS activity was measured according to protocol at early stage and recover stage of NEC. When clinical signs persisted and the initial abdominal radiographs were abnormal, follow-up radiographs were obtained. Results. Of 45 infants who were evaluated for gastrointestinal signs, only 2 had ileus or benign pneumatosis intestinalis with persistently normal PC/PS; gastrointestinal manifestations resolved within 48 hours, antibiotics were discontinued in < 48 hours, and feedings were restarted early without complications. 35 infants had NEC stages II and III; all had decreased PC/PS activity regardless of their blood culture results. PC/PS activity negatively correlative with severity of NEC and positively correlative with the recover form NEC.

Conclusions In infants with suspected NEC, normal PC/PS values would favor aborted antibiotic therapy and early resumption of feedings. PC/PS becomes significantly lower in both stage II and stage III NEC. In infants with NEC, persistently decreased PC/PS after initiation of appropriate medical management suggests associated complications, which may require surgical intervention.

282 MATERNAL PREECLAMPSIA IS ASSOCIATED WITH INCREASED RISK OF NECROTIZING ENTEROCOLITIS IN PRETERM INFANTS

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Objective The aim of this study was to evaluate the effect of maternal preeclampsia on development and severity of NEC in premature infants.

Methods This study consisted 2 groups of preterm infants (\leq 37 gestational age): the study group contained preterm infants born to a preeclamptic mother and the comparison group contained preterm infants born to a normotensive mother. NEC was diagnosed according to clinical and radiographic findings, and it was classified according to modified Bell's criteria.

Result The study group consisted 174 premature infants born to preeclamptic mothers and the control group consisted 327 premature infants born to normotensive mothers. There were a total of 88 infants (40 infants in the study group and 48 infants in the control group) who had NEC diagnosis. The incidence of NEC in infants born to preeclamptic mothers (22.9%) was significantly higher compared with those born to normotensive mothers (14.6%). NEC was more advanced in preeclamptic mother infants. NEC developed significantly earlier in infants with NEC in the study group compared to those with NEC in the control group. The duration of NEC was also significantly longer in infants born to preeclamptic mothers.

Conclusion Maternal preeclampsia may be an important risk factor for development of NEC in premature infants as NEC incidence

and severity of NEC were found to be significantly higher in premature infants born to preeclamptic mothers. Also, NEC developed significantly earlier in preeclamptic mother infants and duration of NEC was also found to be significantly longer in these infants.

283 THE ROLE OF PERITONEAL DRAINAGE IN BELL'S STAGE 2 OF NECROTIZING ENTEROCOLITIS

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Introduction Necrotizing enterocolitis (NEC) has become the most common perinatal gastrointestinal emergency.

In literature there is an ongoing discussion on which surgical approach is the most efficient to maximise patients' survival: laparotomy or percutaneous drainage in case of intestinal perforation.

The aim of this study is to identify the preventive role of the peritoneal drain.

Materials and Methods Between September 2007 and September 2011 a prospective study was carried out at our Hospital.

Informed consent were obtained by parents before treatment;

Inclusion criteria were created.

Group A: placement of abdominal drainage in stage 2;

Group B: surgical treatment only with perforation.

Efficacy of early treatment (absence of subsequent intestinal perforation) was the primary end point; Survival at one month after drainage placement, Hospitalization, Mortality and Morbidity were considered for analysis.

Results 43 infants with stage II NEC were observed. At the end of the study the results shows that: 16 patients were treated with preventive peritoneal drain; 4 of these patients (25%) underwent surgery for advanced NEC (intestinal perforation). Of the other 27 patients, 10 patients (37%) developed advanced NEC, with intestinal perforation. ($p < 0.05$) in each group Patients with advanced NEC showed longer time of meconium evacuation if compared to the others (mean 5 vs. 2 days, $p < 0.05$).

Only 25% of patients treated with PPD underwent laparotomy for bowel perforation ($p < 0.05$).

Conclusions The use of peritoneal drain in stage II NEC seems to be a safe alternative and treatment for these patients.

284 OPIATE ADMINISTRATION TO PRETERM INFANTS - A RISK FACTOR FOR NECROTIZING ENTEROCOLITIS?

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Background and Aims Opiates like morphine and fentanyl are commonly used for sedation in the NICU. There are reports implicating early opiate exposure as a risk factor for NEC in preterm infants. We aimed to investigate if exposure to opiates in the first week of life was a risk factor for subsequent NEC in preterm infants in our NICU.

Methods Cases of NEC (Bell Stage ≥ 2) in infants < 32 weeks gestation age (GA) over a 3-year period (Jan 2008-Dec 2010) were identified from the NICU database. A case-control study was performed by pairing each infant with NEC to a random control, matched for year of birth, GA (± 1 week) and birthweight (BW $\pm 20\%$).

Total exposure to opiates (morphine and fentanyl) between days 1 and 7 was tabulated from medical records and the database. Two-tailed Fisher's exact test was used to calculate the risk.

Results 27 infants with definite NEC were identified with mean GA (\pm SD) of 27.2(± 2.1) weeks and BW of 998 (± 348) g. 54 controls were matched with mean (\pm SD) GA of 27.3 (± 2.2) weeks and BW of 972(± 346) g. Exposure to opiates was not different between NEC and controls ($P = 0.63$; Odds Ratio (95% CI) of 0.73 (0.28–1.91). Median (range) daily opiate over the first week in NEC infants (morphine dose equivalent) was 14.3 (0–259) μ g/kg/day or approx. 0.6 (0–11) μ g/kg/hour.

Conclusions Early opiate exposure did not appear to be a significant risk factor for NEC in our population.

285 CAN MEASUREMENT OF INTRAVESICAL PRESSURE BE USED FOR THE DIAGNOSIS AND FOLLOW UP OF NECROTIZING ENTEROCOLITIS?

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Background and Aims Abdominal compartment syndrome refers to multiorgan failure secondary to increased intraabdominal pressure and circulatory failure. Early diagnosis and treatment of this clinical syndrome resulting with high mortality in children is possible via intravesical pressure (IVP) measurements. Data on IVP is limited in newborns with increased abdominal pressure due to diseases like necrotizing enterocolitis (NEC). We aimed to investigate the predictive value of consecutive IVP measurements for diagnosis and outcome of NEC.

Methods IVP was measured twice daily for 10 days in 61 premature infants below 1500 grams. Measurements of infants with and without NEC were compared.

Results Infants were grouped as;

Group 1: without NEC,

Group 2: NEC medically treated,

Group 3: operated for NEC.

Group 1 had lower IVP values compared to infants with NEC ($p = 0.001$). Group 2 and 3 had similar IVP values ($p = 0.155$). A 10% increase in the consecutive IVP measurements was valuable for predicting NEC. Infants who died due to NEC had higher IVP values compared to surviving infants with NEC ($p = 0.043$).

Conclusion IVP measurements may be helpful for the diagnosis of NEC. Mortality due to NEC in premature infants may also be predicted with high IVP values.

286 LOW HAEMATOCRIT LEVELS IS COMMON IN PREMATURE INFANTS THAT DEVELOP NECROTIZING ENTEROCOLITIS

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Introduction Necrotising enterocolitis (NEC) remains a serious complication of prematurity. NEC is associated with multiple factors. Recently concerns have been raised that transfusion related gut injury (TRAGI) may lead to NEC development.

Aim To identify if blood transfusion is implicated in the development of NEC in our population.

Methods Data collection from infants treated for definite NEC in two tertiary surgical neonatal units.

Results 49 infants developed NEC. GA: ≤ 24 wks 16%, 25–26 wks 16%, 27–29 wks 37%, 30–32 wks 19%, 33–36 wks 12%. Age of NEC: ≤ 7 d: 7%, d8–14: 19%, > 14 d: 74%. The lowest hematocrit (HCT) within 72 hours preceding NEC diagnosis was < 24 8%, 24–29 in 28% of cases, 30–35 in 36%, 36–42 in 11%, 17% had Hct > 42 . 6%