Abstracts

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 antiinflammatory and antioxidant properties.

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 at Kangnam CHA Hospital NICU from January 2006 to December 2009. Preterm infants (G.A > 29 wk, B.W > 740 g < 1490 g) were grouped NEC group (n=18, ≥ 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±2.15 wk, 1027.78±343.57 g) was significant in Apgar(1)(p=0.01), (5.67±1.64 vs 6.45±1.41, p=0.03) score and RDS (100% vs 80.9%, p=0.04) with No-NEC group (n=162, 28.96±2.98 wk, 1134.2±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: 1.41 vs 6.45 P=0.03) score and RDS was significant correlation with NEC.

Abstract 280 Table 1 Clinical Characteristics of Preterm Infants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>NEC (n=18)</th>
<th>No-NEC (n=162)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.W (g)</td>
<td>1027.78±343.57</td>
<td>1134.2±271.36</td>
<td>NS</td>
</tr>
<tr>
<td>G.A (wk)</td>
<td>27.61±2.15</td>
<td>28.96±2.98</td>
<td>NS</td>
</tr>
<tr>
<td>Male gender</td>
<td>7 (38.89%)</td>
<td>77 (47.53%)</td>
<td>NS</td>
</tr>
<tr>
<td>Apgar (1min)</td>
<td>3.33±1.5</td>
<td>4.39±1.64</td>
<td>0.01</td>
</tr>
<tr>
<td>Apgar (5min)</td>
<td>5.67±1.64</td>
<td>6.45±1.41</td>
<td>0.03</td>
</tr>
<tr>
<td>PDA (mmHg)</td>
<td>7 (38.89%)</td>
<td>29 (47.01%)</td>
<td>NS</td>
</tr>
<tr>
<td>RDS (%)</td>
<td>18 (100%)</td>
<td>131 (80.86%)</td>
<td>0.046</td>
</tr>
<tr>
<td>Ventilator</td>
<td>8.33±7.28</td>
<td>6.99±11.22</td>
<td>NS</td>
</tr>
<tr>
<td>Transfusion</td>
<td>16 (88.89%)</td>
<td>124 (76.54%)</td>
<td>NS</td>
</tr>
</tbody>
</table>

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

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 (≤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 prema-
ture 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.

**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 maximize patients’ survival: lapa-
roscopy 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 per-
foration) 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 pre-
ventive peritoneal drain; 4 of these patients (25%) underwent sur-
gery for advanced NEC (intestinal perforation). Of the other 27
patients, 10 patients (37%) developed advanced NEC, with intesti-
nal 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.

**OPIATE ADMINISTRATION TO PRETERM INFANTS - A RISK
FACTOR FOR NECROTISING ENTEROCOLITIS?**

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**Background and Aims** Opiates like morphine and fentanyl are
commonly used for sedation in the NICU. There are reports impli-
cating 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 22) in infants < 32 weeks gesta-
tion age (GA) over a 3-year period (Jan 2008-Dec 2010) were identi-
fied 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 ± 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 (±SD) of 27.2(±2.1) weeks and BW of 998 (±348) g. 54 controls
were matched with mean (±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) µg/kg/day or approx.
6.0 (0–11) µg/kg/hour.

**Conclusions** Early opiate exposure did not appear to be a signifi-
cant risk factor for NEC in our population.

**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 pres-
sure 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 dis-
eases 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 prema-
ture 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 pre-
dicting 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 pre-
dicted with high IVP values.

**LOW HAEOMATOCRIT LEVELS IS COMMON IN PREMATURE
INFANTS THAT DEVELOP NECROTISING ENTEROCOLITIS**

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**Introduction** Necrotising enterocolitis (NEC) remains a serious
complication of prematurity. NEC is associated with multiple fac-
tors. 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 develop-
ment 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: ≤7d: 7%,8–14: 19%, >14d: 74%. The lowest hematocrit (HCT) within 72 hours preceding NEC diagnosis was ≤24%, 24–29
in 28% of cases, 30–35 in 36%, 36–42 in 11%, 43% had Hct >42. 6%