between intrauterine growth inhibition and NO activity in late preterm infants.

Methods Newborns with gestational age of 34–36 weeks and birth weight of 1200–2600 g were allocated to two groups: 21 infants with normal growth parameters were classified as first group and 15 intrauterine growth restricted (IUGR) infants were included in second group. Gestational age was assessed by the last menstrual period and confirmed by scale of Ballard et al. Plasma and urine samples of infants were collected on the first day of life. Nitric oxide concentration quantified by principle based on using the enzyme Nitrate Reductase to convert nitrate to nitrite.

Results Mean plasma nitrat products were higher ($p<0.05$) in second group infants(42.6±7.3 μM/L), than in first group (59±7.3 μM/L). Statistically true rising ($p<0.01$) was noted in urine NO level of IUGR infants, where mean NO level was 1.4 times higher compared with first group newborns.

Conclusion Intrauterine growth retardation is associated with high NO production of infants at an early neonatal period, which might indicate intrauterine activation of NO sources of fetus.

1043 EVALUATION OF PEDIATRIC TESTES AFTER SURGERY BY LASER DOPPLER AND WHITE LIGHT SPECTROSCOPY

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Aim To evaluate testes after unilateral orchiopexy Laser Doppler and white light spectroscopy and compare microcirculation with contralaterat testis and healthy controls.

Methods A combination of the laser Doppler (determination of blood flow) and white light spectroscopy (determination of oxygen saturation and hemoglobin amount) is used to determine microcirculation at two different depth levels non-invasively. Patients were recruited after unilateral orchiopexy. Controls were age-matched boys without relevant disease. Ethical approval was obtained.

Results 99 patients were included after unilateral orchiopexy at the age of 3.5 years (+-2.9 years). 65% underwent surgery after their second birthday. Follow-up was at median 2.5 years after surgery (3months – 10.5 years). Controls were 29 boys at the age of median 6.3 years (3 month–13 years). There was no significant difference in age between both groups.

85 patients were examined on the operated side with laser doppler and white light spectroscopy. Significant higher flow and velocity were found contralateral ($p=0.041$, $p=0.022$). Surprisingly, when comparing the contralateral testes in patients after orchiopexy with healthy controls, flow and velocity were significantly higher in the healthy controls ($p<0.001$), even though this testis was previously not operated on.

Conclusion After orchiopexy, expected differences were found in microcirculation between the operated and contralateral testes or healthy controls. Surprisingly, the contralateral testes' microcirculation was also significantly different from controls. This is probably not a consequence of surgery alone, but more likely a common problem of both testes in the affected patients.

1044 EVALUATING MODE OF DELIVERY OF IRON OR IRON AND ZINC ON IRON STATUS AND IRON STRESS MARKERS

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Background Iron deficiency remains a major nutritional problem among infants and young children in India. The tablet/syrup-based programs do have logistic, supply and compliance challenges. Tablet/Syrup may have increased risk of free iron in blood, oxidative stress and risk of infections.

Objective In a community based RCT we evaluated 3 approaches of iron delivery for impact on iron status, pro and anti-inflammatory interleukins and non-transferrin bound iron (NTBI) with 30 day intervention.

Methods 300 children 22–34 months were enrolled and randomized to receive either iron fortified biscuit (n=74), iron tablet (n=77), iron+ zinc tablet (n=74) or placebo (n=75) for 30 days.

Results Delivery of iron through biscuit showed better impact on hemoglobin (Mean Diff: 0.60; 95 % CI: 0.16–1.04) and other hematological markers like RDW, MCV and MCH at 30 day post supplementation. The NTBI estimation at day 1 and 30 post supplementation, 3 hours after ingestion of supplement dose; an indicator of oxidative stress caused by dose after iron status repletion, suggested the lowest burden with biscuit (2 %) and a higher burden with supplements (6–7 %). At day 30 there was no effect on interleukins in the biscuit group; increase in IL-6/IL10 in iron tablet, increase in IL-8/IL10 in iron+zinc tablet group.

Conclusion Providing iron through fortified biscuits was as efficient and effective in improvement of iron status and hematological markers as iron tablets. Biscuit was marginally better for NTBI or immune response. The benefit of using biscuits needs to be evaluated in a larger community based effectiveness program.

1045 LONGITUDINAL STUDIES OF BREAST MILK ZINC TRANSFER TO APPROPRIATE- AND SMALL-FOR-GESTATIONAL-AGE, PREDOMINANTLY BREAST FED, BANGLADESHI INFANTS

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Background In developing countries, information is limited on concentration of breastmilk zinc, total amount of zinc transferred to infants through breast milk and whether zinc transfer through breastmilk differs among appropriate-for-gestational-age (AGA) and small-for-gestational-age (SGA) infants at different times post-partum.

Aims To measure breastmilk and zinc transfer through breastmilk, using deuterium "dose-to-mother" technique, in mothers of AGA and SGA infants.

Methods Forty-six mother-infant pairs were recruited (20 AGA and 26 SGA infants). Each mother-infant pair was studied three times, at 4, 12 and 24 weeks post-partum. In each round, two-week studies of breast milk transfer were carried out, using the deuterium oxide "dose-to-mother" technique. Breast milk samples were collected on days 1 and 5 of each round for milk zinc concentration.

Results Mean (±SD) birth weight and length were 3.02±0.2 kg and 48.2±1.2 cm for AGA infants and 2.34±0.20 kg and 46.2±1.1 cm for SGA infants. Breast milk intake increased gradually with time post-partum, and was marginally greater among AGA infants only at 4 weeks ($p=0.06$). Breast milk zinc concentration decreased when the infants grow ($p<0.001$), but differed between neither of the groups. Zinc transfer through breast milk decreased significantly with age in both the groups, but did not differ ($p<0.001$).

Conclusions Breast milk zinc concentration among Bangladeshi mothers was similar to values reported for women from wealthier countries, and there was no relationship between infant birth weight category and milk zinc concentration or milk zinc transfer.

1046 IODINE STATUS IN PRESCHOOL CHILDREN AND EVALUATION OF MAJOR DIETARY IODINE SOURCES: A GERMAN EXPERIENCE

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