Clippings

❑ Could prolonged preterm rupture of membranes (PPROM) be caused by increased maternal immune response towards fetal antigens? A fetus, in spite of being semi-allogeneic, is accepted by the maternal immune system but the alloresponsive mechanisms may not be conducive for a successful outcome of pregnancy. On comparing the allogeneic T-cell responses of non-pregnant women with those of normal pregnant women and pregnant women with gestation-associated diseases, it was found that Stimulation Indices (SIs) were reduced in pregnant women as compared to non-pregnant women. On exposing the T cells of pregnant women to Peripheral blood mononuclear cells (PBMCs) from their own fetus, there was a further significant decrease in their SIs, but the SIs of pregnant women with PPROM were significantly higher than that of normal pregnant women. This was not seen when the PBMCs of women with PPROM were exposed to those of unrelated volunteers. In addition, an increased humoral immune response was assessed for women with PPROM in comparison with women with uncontrollable preterm labor. The authors suggested that a strongly reduced allogeneic T cell response of PBMCs from pregnant women was further down regulated when PBMCs from their own fetus were used. However, women with PPROM show an increased maternal T cell response specifically toward the fetal HLA antigens. Pediatr Res 2005: 58; 648-653.

❑ Can high dose Growth Hormone (GH) treatment overcome the growth suppressive and catabolic effects of Dexamethasone (Dexa) treatment used for prevention of bronchopulmonary dysplasia (BPD) in very pre-term neonates? A randomized, placebo-controlled GH trial conducted in 30 ventilated very low-birth weight (VLBW) infants who were at risk for BPD who were treated with Dexa were assigned to receive either high-dose GH (0.3mg/kg/d) or placebo treatment for 6 weeks after start of DEXA, which was given for 24 d (starting dose 0.5 mg/kg/d, tapering off every third day). Growth during the 6-wk study period was not different between the GH and the placebo groups. Two patients in the placebo group died, but the number and the severity of adverse effects were not statistically different between the GH and placebo groups. The authors concluded that high-dose GH treatment did not improve growth in DEXA-treated VLBW infants and thus cannot be recommended to prevent growth failure in these infants. Pediatr Res 2005; 58: 705-712.

❑ Can End-Tidal CO2 predict the need for hospitalization in children with an acute exacerbation of asthma? In a prospective cohort study of children aged 5 to 17 years with acute asthma, a baseline capnography measurement was performed and a ratio was calculated, using length of the plateau portion of the baseline capnograph waveform (measured in mm) and dividing it by the respiratory rate at the time of measurement. The main outcome measure was hospitalization vs. discharge from the pediatric emergency department. Of the 37 patients, the hospitalized (n = 12) and discharged (n = 25) groups did not differ in terms of any demographic or baseline characteristics except for pulmonary score and the median baseline capnography ratio. The median ratio was 0.15 and 83.3% of hospitalized patients had values below this as against 32% of those who were

discharged ($p<0.05$). After controlling for the baseline asthma severity, the odds of being hospitalized with a ratio <0.15 were 18.77 (95% confidence interval, 1.91-184.69). This study highlights that baseline end tidal CO2 could be an objective effort-independent tool which could be helpful in predicting need for hospitalization in children with acute asthma exacerbation. Pediatr Emerg Care 2005; 21: 574-577.

❑ Administration of oral glucose prior to blood sampling is known to reduce the pain associated with blood sampling. But which method of blood sampling produces less pain - venepuncture (VP) or heel lancet prick (HL)? This was the subject of a double-blind, randomised, placebo-controlled trial carried out in 100 healthy, full term newborn infants being screened for inborn errors of metabolism who were randomly allocated to one of four experimental groups (25 infants in each) - HL or VP, given either oral sucrose or water. Neonatal pain was assessed by the neonatal facial coding system (NFCS), as well as by crying when specially trained nurses took samples 2 minutes after administration of oral sucrose or water. The results showed that without sucrose, the NFCS score was higher in the HL group than the VP group during blood sampling ($p<0.001$) and oral sucrose significantly reduced the score of the HL group ($p<0.01$) and also tended to reduce the score of the VP group ($p<0.1$). However, the HL with sucrose group still had a higher score than the VP without sucrose group ($p<0.01$) suggesting that although oral sucrose may have an additive analgesic effect, it is not necessarily required if VP is used for blood sampling, since the former is more effective and less painful than HL for blood sampling in newborns. Arch Dis Child- F&N 2005; 90: F432-F436.

❑ The association between gastro-oesophageal reflux disease (GORD) and asthma is well known, but does acid suppression treatment reduce the severity of asthma symptoms? This was studied in a randomised controlled trial among 38 children (mean age 10.8 years, range 7.2-16.8; 29 males) with asthma and a reflux index ³5.0 assessed by 24 hour oesophageal pH monitoring, who were randomised to 12 weeks of treatment with omeprazole 20 mg daily or placebo. The primary endpoints were asthma symptoms (daytime wheeze, symptoms at night, morning, and during exercise) and quality of life (PAQLQ) and the secondary endpoints were changes in lung function and the use of short acting bronchodilators. At the end of the study, a repeat pH study was done to confirm the efficacy of acid suppression and the results showed that the change in total symptom score did not differ significantly between the 2 groups and the PAQLQ score increased by 0.62 (95% CI 0.29 to 0.95) in the omeprazole group compared to 0.50 (95% CI 0.29 to 0.70) in the placebo group. Change in lung function and use of short acting bronchodilators were similar in the groups and acid suppression was adequate (reflux index <5.0) under omeprazole treatment. This study therefore failed to show any improvement in asthma symptoms or lung function with omeprazole treatment in children with asthma and concomitant GORD. Arch Dis Child 2005; 90: 956-960.

❑ Can biochemical markers predict the outcome of renal dysfunction associated with birth asphyxia better than clinical markers? In a prospective case-control study evaluating 25 inborn babies 34 weeks gestation having asphyxia (5 min Apgar 6 or needing resuscitation 5 min) as against 25 gestation- and weight-matched babies with no asphyxia, who were enrolled as 'controls', the renal function tests, calculated renal indices using timed urine collections and excretion

of ß2-microglobulin and N-acetyl-ß-D-glucosaminidase (NAG) were monitored in both the groups for first 4 days of life. Fourteen (56 per cent) asphyxiated babies had acute renal failure (ARF) as compared to 1 (4 per cent) control (p = 0.002) and the blood urea and serum creatinine values were significantly higher in asphyxiated babies on day 4 but not on day 2. Renal failure index and FeNa were higher in asphyxiated babies on both day 2 and day 4, but creatinine clearance was not different. Urinary excretion of both ß2-microglobulin and NAG was higher in the asphyxiated babies on day 2 as well as day 4. Five minute Apgar 6 had the best sensitivity to predict renal failure. A combination of high serum creatinine and high blood urea had 100 per cent sensitivity and negative predictive value to predict adverse outcome while serum creatinine >1.5 mg/dl alone had the best specificity and positive predictive value. The renal parameters were however poorer predictors of adverse outcome in comparison to clinical markers like 5 min Apgar 3 and HIE stage II/III. The study concluded that clinical markers of asphyxia were better predictors of adverse outcome than renal function tests. J Trop Pediatr 2005; 51: 295-299.

❑ Are there any diagnostic signs that could help guide the clinician in deciding about use of antibiotic therapy in children presenting with a sore throat? Since most of the world's children live in regions where laboratory facilities are not available, clinical prediction rules can be useful to guide clinicians' decisions on antibiotic therapy for streptococcal pharyngitis (GABHS), and to reduce routine presumptive antibiotic therapy for all cases of pharyngitis. A prospective cohort study to assess diagnostic signs and develop a prediction rule was done and bivariate and multivariate analyses were used to develop clinical rules. From a cohort of 410 children in Cairo, Egypt, aged from 2 to 12 y, presenting with complaint of sore throat, 101 (24.6%) children had positive GABHS culture. Pharyngeal exudate, tender or enlarged anterior cervical lymph nodes, season, absence of rash, or cough or rhinitis were associated with positive culture in bivariate and multivariate analyses. Three variables (enlarged nodes, no rash, no rhinitis), when used in a cumulative score, showed 92% sensitivity and 38% specificity in these children. The authors concluded that in comparison to universal treatment of all pharyngitis, the application of this rule would reduce antibiotic use in GABHS-negative cases by about 40%. Acta Paediatr 2005; 94: 1038-1042.

❑ Sepsis significantly alters skeletal muscle mitochondrial function, but the mechanisms responsible for this abnormality are unknown. The effects of endotoxin-induced sepsis on mitochondrial ATP (adenosine triphosphate) formation and electron transport chain protein composition was studied by measurement of diaphragm mitochondrial oxygen consumption and mitochondrial nicotinamide adenine dinucleotide, reduced form, oxidase assays in control rats (n = 13) and rats given endotoxin (8 mg/kg/d) for 12 (n = 14), 24 (n = 14), 36 (n = 14), and 48 h (n = 13). This was based on the hypothesis that endotoxin elicits specific changes in electron transport chain proteins that produce derangements in mitochondrial function. The results showed that endotoxin administration: (1) elicited large reductions in mitochondrial oxygen consumption (*e.g.*, 201 ± 3.9 SE natoms O/min/mg for controls and 101 ± 4.5 SE natoms O/minutes/mg after 48 h endotoxin, p <0.001), in nicotinamide adenine dinucleotide, reduced form, oxidase activity (p <0.002), and in uncoupled respiration (p < 0.001) and (2) induced selective reductions in two

subunits of Complex I, three subunits of Complex III, one subunit of Complex IV, and one subunit of Complex V. The time course of depletion of protein subunits mirrored alterations in oxygen consumption. The authors concluded that endotoxin selectively depletes critical components of the electron transport chain that diminishes electron flow, reduces proton pumping and decreases ATP formation. AJRCCM 2005; 172: 831-836.

❑ Can propofol be safely used for sedation for magnetic resonance imaging/spectroscopy (MRI/MRS) in children? A study of 108 MRI/MRS procedures under propofol sedation were performed longitudinally on children at ages 3-4 years (N = 59) and 6-7 years (N = 49) and sedation parameters, physiological values, and outcome data were collected. Success rate for acquisition of satisfactory quality MRI/MRS during propofol sedation was compared with that of age-matched sleeping children. Only 5 minor events (2 with need to insert an oral airway, 2 with premature termination of study, 1 with bradycardia not requiring treatment) and no major events occurred and these safety/efficacy data are equal to or better than previously reported with propofol for clinically indicated procedures. The success rate of data acquisition was significantly higher during propofol sedation (98%) than during late-night sleep studies in children (30%-50%). The authors concluded that propofol sedation for MRI/MRS is safe and effective when children of appropriate ASA class are selected, supplemental oxygen is delivered, and sedation and monitoring are done by an experienced anesthesiologist. J Neurosurg Anesthesiol 2005 17(4): 180-192.

❑ Can steroid doses be titrated based on the measures of airway inflammation in children with asthma? The fraction of nitric oxide in exhaled air (FENO) is a marker of airway inflammation in asthma and treatment guidelines are mainly symptom-driven but symptoms are not closely related to airway inflammation. In a randomized controlled trial, 85 children with atopic asthma, using inhaled steroids, were allocated to a FENO group (n = 39) in which treatment decisions were made on both FENO and symptoms, or to a symptom group (n = 46) treated on symptoms only. Children were seen every 3 months over a 1-year period and symptoms were scored during 2 weeks before visits and 4 weeks before the final visit. FeNO was measured at all visits, and airway hyper responsiveness and FEV1 were measured at the start and end of the study. Primary endpoint was cumulative steroid dose and the study evaluated whether titrating steroids on FENO improved asthma management in children. Changes in steroid dose from baseline did not differ between groups. In the FENO group, hyper responsiveness improved more than in the symptom group (2.5 vs. 1.1 doubling dose, p = 0.04) but the change in FEV1 was not significantly different between groups. The FENO group had 8 severe exacerbations vs 18 in the symptom group but the change in symptom scores did not differ between groups. FENO increased in the symptom group and the change in FENO from baseline differed between groups (p = 0.02). The authors concluded that 1 year of steroid titration on FENO did not result in higher steroid doses and did improve airway hyper responsiveness and inflammation. AJRCC M 2005; 172: 831-836.

Lokesh Guglani
Senior Resident,
Department of Pediatrics
All India Institute of Medical Sciences,
New Delhi - 110029.
Email- lokesh13@hotmail.com