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Oral Presentation (Doctor's Session)

Adipokines in Children with Obstructive Sleep Apnea and the Effects of Treatment

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Background: The objective of this study was to evaluate circulating adipokines concentration in children with and without OSA and to determine the effects of treatment for OSA on their plasma concentration.

Methods: Children with habitual snoring and symptoms suggestive of OSA were consecutively recruited. Their parents completed a sleep apnea symptom questionnaire, and the subjects underwent physical examination and an overnight polysomnography (PSG). OSA was diagnosed if obstructive apnea index (OAI) >1. Fasting serum adiponectin, leptin and lipid profile were taken after overnight PSG. The subjects were divided into obese, non-obese, with and without OSA for comparison.

Results: 141 children of whom 96 were boys, with a median (IQR) age of 10.8 (8.5-12.8) years were recruited. Forty-three subjects were found to have OSA. Subjects with OSA did not have significant different adiponectin and leptin concentrations than those without OSA for both obese and non-obese groups. Stepwise multiple linear regressions revealed that systolic blood pressure (SBP), age, HDL-C and BMI z-score were independently associated with adiponectin, while diastolic blood pressure (DBP), TG, height and BMI z-score were independently associated with leptin concentration. Sixteen OSA children underwent treatment and there was reduction in their plasma adiponectin concentration after intervention [pre vs. post-adiponectin, 9.40 (7.2) vs. 7.03 (5.6), P=0.046].

Conclusion: Body mass index rather than OSA was the main determinant of adipokines in children.

Paediatric Inflammatory Bowel Disease in Hong Kong Children: A 10-Year Review in a Single Paediatric Surgical Center

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Objectives: The clinical course of paediatric inflammatory bowel disease (IBD) in Chinese children had not been previously described in literature. We aim to describe the disease course in this cohort and to evaluate the outcome of our patients.

Materials and Methods: Patient-records from a single paediatric surgical center were reviewed to generate data concerning the clinical presentations, investigations and treatments.

Results: Data were collected on 30 children with childhood onset IBD (<17 years of age). 90% had Crohn's disease and 10% had ulcerative colitis. Mean age at diagnosis was 12.9 years with a male (73%) predominance. Only two patients had family history. The median 'lagtime' between first presenting symptoms and diagnosis was 1.5 months. The most common presenting symptom was weight-loss (73%), followed by abdominal pain (67%), diarrhoea (53%) and malaise (53%). Gastric involvement was present in 30% evident by upper endoscopy. All patients received colonoscopy: only 10% patients had isolated small bowel involvement, 43% had isolated colonic involvement and 47% had both. Peri-anal disease was present in 40%, joint pains in 30%. 60% received enteric supplements; 13% received prolonged parenteral nutrition. 83% patients received steroid (median duration of 3 months). Intestinal complications occurred in 17% of cases, mostly (10%) requiring surgery.

Conclusions: This retrospective study provides information on IBD in Chinese children. Familial IBD is rare in this locality. Non-specific symptoms were the most common initial presentations; early diagnosis mandates a high index of suspicion. Colonic and pan-gastrointestinal tract disease is common in childhood Crohn's. Multi-disciplinary management is essential.

Endothelial Function in Children with Obstructive Sleep Apnoea Syndrome (OSAS): A Case – Control Study

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Introduction: In adults, OSAS has been increasingly recognized as an important and independent risk factor for cardiovascular disease. One of the postulated mechanisms is that OSAS can precipitate or accelerate atherosclerosis, and accumulating scientific evidence suggests the link between OSAS and atherosclerosis is endothelial injury. This study aimed to evaluate vascular reactivity, in particular endothelium-dependent flow-mediated dilation (FMD) in children with obstructive sleep apnoea syndrome (OSAS) compared with matched controls, and its response to OSAS treatment.

Methods: Children aged 6-18 years suspected to have symptoms of OSAS were recruited from our sleep disorder

clinic. Non-snoring controls were recruited from a follow-up study of a previously conducted growth survey in the territory. All participants underwent nocturnal polysomnography and vascular reactivity assessment to diagnose OSAS and to determine FMD respectively. A subgroup of children with OSAS, who either refused treatment or were treated with adenotonsillectomy (T&A) or nasal corticosteroid therapy, was reassessed 3-9 months after the treatment period.

Results: A total of 270 children were recruited, of whom 68 were non-snoring healthy controls (obstructive apnoea hypopnoea index, AHI, <1), 58 were primary snorer (PS, AHI <1 with habitual snoring), 55 were mild OSAS cases (AHI 1-5) and 89 were moderate-to-severe cases (AHI >5). The results demonstrated that FMD had a decreasing trend across groups of increasing severity of sleep disordered breathing (SDB), even after adjustment for age, gender and BMI z score (*p* for trend=0.001). A total of 71 children took part in the follow-up visit after treatment of OSAS. Thirty-four of them underwent adenotonsillectomy, 23 of them received a 3-month therapy with nasal corticosteroid, while the remaining 14 children refused any treatment. Thirty-nine of them were effectively treated as defined by a reduction of AHI by more than 70%. The results showed that the increase in FMD in the effectively treated group was significantly greater than the ineffective group (p= 0.005).

Conclusions: This study suggested that childhood OSAS leads to endothelial dysfunction reflected by reduced FMD. The impairment is reversible with effective treatment for OSAS.

An Evaluation of Public Awareness, Knowledge and Attitude Towards Developmental Dyslexia in Hong Kong

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Dyslexia is a common developmental condition affecting 10% of children in Hong Kong. Despite its long term effects on educational and vocational achievement and psychological development on affected individual, it is often oblivious to parents, teachers, and health care professionals. Early identification and intervention allows affected individual to achieve their best potential and ensures promising outcome.

Objective: To evaluate the public's awareness of dyslexia, and their knowledge on its common features and on the resource to help children with dyslexia in Hong Kong. To assess the public's perception and attitude towards children having dyslexia. To find out factors affecting people's attitude and acceptance of children with dyslexia.

Method: Cross-sectional territory-wide survey 8094 households were interviewed on awareness, knowledge and attitude towards developmental disabilities in children, as part of the government territory-wide Thematic Household Survey. Respondents were interviewed on their demographic data including age, sex, marital status, parenthood status, occupation, education attainment and then on questions related to ten specific types of developmental disabilities (dyslexia being one of them) in children.

Results: 25% of the study population had never heard of dyslexia, with decreasing awareness in the older age groups. Among those who were aware of the condition, 40% of the subjects had the misconception that "children with dyslexia have lower intelligence", 35% believed that dyslexia will be outgrown, which is untrue and 16% agreed the statement that "it is treatable by medication", which is again untrue. A smaller proportion (~10%) falsely believed that school failure means dyslexia. On the other hand, ~46% agreed that children who write reversals have dyslexia, and ~60% agreed that children with dyslexia can also have problem in attention control. Concerning attitude, 50% of the subjects considered children with dyslexia unsuitable to attend mainstream school, 12% would not accept children with dyslexia to be classmates of their own children, 6% would not accept children with dyslexia to be their neighbour and 5% would not opt to let their friends or relative know if their children had dyslexia.

Conclusion: In Hong Kong, a metropolitan city with high demand on academic performance, public awareness of dyslexia is low. Public education is crucial to clarify misconceptions and thereby destigmatise dyslexia. Healthcare workers have a strong role to promote and protect equal opportunities for children with dyslexia.

Determinants of Spirometric Parameters in Young Chinese Children

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Background: Spirometry is a standard diagnostic and monitoring tool in many childhood respiratory diseases. The correct interpretation of lung function abnormalities necessitates wellvalidated spirometric reference standards, but such data is lacking in Asian preschoolers. This study established spirometric references in local young Chinese children, and delineate the effects of demographic and early-life factors on these references.

Methods: This abstract presented the interim analysis of an ongoing population-based, cross-sectional and observational study in Chinese children attending local

kindergartens. Subjects' parents completed an internationally-validated questionnaire on demographics, environmental exposures and respiratory health status. Following stringent quality control criteria, these children performed incentive spirometry to provide data on forced expiratory parameters.

Results: 474 children were recruited from 7 randomly selected kindergartens. Thirty-one (6.5%) and 49 (10.3%) children had physician-diagnosed asthma and current wheeze, respectively. They were excluded from analysis. The mean (SD) age of the remaining 413 children was 4.3 (1.1) years, and 233 (56.4%) were ≤4 years old. About half of them were boys. Their mean (SD; range) height was 107.4 (7.7; 86-128) cm. Three hundred and eighty six (93.5%) children provided evaluable spirometric data. When compared with girls, boys had higher forced expiratory volume in 0.5-second ($FEV_{0.5}$; *P*=0.005), $FEV_{0.75}$ (*P*=0.001), FEV1 (*P*=0.001), forced vital capacity (FVC; *P*=0.001) and peak expiratory flow (*P*=0.025). On the other hand, $FEV_{0.5}$/FVC was independent of gender (*P*=0.063). All these parameters except $FEV_{0.5}$/FVC were also highly height-dependent (*P*<0.001). Current maternal smoking was associated with lower forced expiratory volumes (*P*=0.007-0.009), and these effects were much stronger than exposures to maternal smoking during pregnancy or infancy. Being born in Hong Kong (91.3%) was also associated with lower forced expiratory volumes (*P*=0.006-0.017). Breastfeeding ever or family history of asthma did not influence these spirometric indices (*P*>0.15 for all).

Conclusions: Our interim data suggests that forced expiratory volumes of young Chinese children as measured by incentive spirometry are affected by gender, height, passive smoke exposure and place of birth.

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Prognostic Factors in Children with Continuous Renal Replacement Therapy

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Objectives: To identify the prognostic factors of Paediatric patients received Continuous Renal Replacement Therapy (CRRT) in paediatrics and neonatal intensive care unit.

Methods: Patients having received CRRT in either NICU or PICU of Queen Elizabeth Hospital from January 1998 to December 2008 were retrospectively analyzed through review of medical records. Comparisons were made between survivors and non-survivors regarding types of CRRT, various demographic and prognostic factors.

Results: Thirty-seven patients with thirty-nine episodes of CRRT were identified throughout the enrolment period. Male to female ratio was 24:15. There were 15 (38.5%) neonatal patients with mean birth weight 2.55±0.74 kg (0.92 - 3.7 kg), and 24 (61.5%) paediatric patients with mean age 8.0±6.4 years (6 months to 18.2 years). Causes of renal failure included multi-organ failure (21 patients), poor cardiac output (5 patients), primary renal disease (7 patients) and metabolites or toxin overload (6 patients). There were 25 episodes of CVVH/D, and 16 episodes of CAVH/D. Most neonates received CAVH/D (14 out of 16 episodes) whereas most paediatric patients received CVVH/D (23 out of 25 episodes). The overall mortality was 41% (neonatal vs paediatric mortality: 60% vs 29.2%). There was no significant difference in the mean ultrafiltration rate among survivors and non-survivors in both CAVH/D (p=0.25) and CVVH/D (p=0.5). In the non-survivors, there were a higher proportion of multi-organ failure (p=0.002), more severe pre-CRRT fluid overload (p<0.001) and metabolic acidosis (p=0.001), more use of ventilatory (p=0.029) and inotropic support (p=0.001), together with a higher PRISM III score (p=0.001) and a higher number of organ failure (p<0.001). Multivariate analysis identified PRISM III score and fluid overload as independent predictors of mortality. Kaplan-Meier survival analysis identified that patients with pre-CRRT fluid overload of >5.5% would have poorer survival time during ICU stay as compared to those having less severe fluid overload (p=0.011).

Conclusion: A higher PRISM III score, multi-organ failure, metabolic acidosis, degree of fluid overload, requirement of inotropic and ventilatory support contributed significantly to mortality of the study subjects. Degree of pre-CRRT fluid overload was identified as an independent predictor of mortality.

Double Unit Umbilical Cord Blood Transplant for Children with Acute Leukemia

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Objective: To evaluate the result and outcome of double unit cord blood transplant (DU-CBT) for children with acute leukemia.

Methods: DU-UCBT was performed in 11 children (8 Male, 3 Female) with acute leukemia in a single institution from 09/2006 to 08/2009. All the cord blood units were from local public cord blood bank (HKRCBTS CBB). Five were acute lymphoblastic leukemia (ALL) and six were acute myeloid leukemia (AML). We evaluated the rate of engraftment, transplanted cell dose, chimerism status, degree

of HLA mismatch and severity of graft-versus-host disease (GVHD).

Results: Mean age and body weight were 9.0 + 4.1 year and 29.3 + 12.2 kg respectively. The cord blood units (CBUs) were not more than 2 HLA antigen mismatch from the patients. Overall engraftment rate was 91%, one did not engraft. The infused total NC and CD34 cell were 7.85+3.25x10^7/kg and 3.5±1.3x10^5/kg respectively.

In 8 CBT, the two CBUs were having the same degree of HLA mismatch from the recipient. CD34 cell of the engrafted CBU was significantly higher than the other unit (2.2±1.2x10^5/L vs 1.2±0.56x10^5/L, p=0.023). NC was also higher for the engrafted unit when compared with non-engrafted unit (4.28±1.87x10^7/L vs 3.43±2.0x10^7/L, p= 0.11). In the other two CBT, the CBU having better HLA matching (5/6 matched vs 4/6 matched) engrafted despite a lower NC (2.8x10^7/kg vs 5.5x10^7/kg) and CD34 cell (1.2x10^5/kg vs 2.5x10^5/kg).

In the whole group, neutrophil engraftment was achieved on 20±5 days. In 7 subjects, single unit complete chimerism (CC) was demonstrated on day 7. A brief period of mixed chimerism existed in the other three subjects and CC of the dominant unit was achieved 2 to 8 weeks after transplant. All subjects with engraftment developed acute graft versus host disease (GVHD). The incidence of grade III-IV GVHD was 20% and none died from acute GVHD. Severe bacterial infection happened in 3 patients. CMV reactivation occurred in 5 patients and resulted in one death.

Conclusions: DU-CBT achieved engraftment rate of 91% in acute leukaemia children. CBU with higher cell dose engrafted when the two CBUs had similar degree of HLA mismatch. Better HLA matching may be more important than cell dose in determining engraftment unit when the two CBU differed in degree of HLA mismatch.

Characteristics & Outcome of Metastatic Infant Neuroblastoma

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Background: Metastatic neuroblastoma in infancy behaved differently from those of older children. A significant proportion of them can regress spontaneously (stage 4S). The *MYCN* status, Shimada classification, DNA index & 11q rearrangement may affect the outcome and has been adopted as guidance for treatment stratification. We reviewed our experience on this cohort of patients.

Patients and Method: This is a prospective cohort study. The patients were recruited from 5 regional hospitals which take care of all children with cancer locally. The data were collected by 2 data managers sponsored by Children Cancer Foundations. Infant was defined as patients ≤ 365-day-old. The staging was according to the INSS system. The presence of abnormal bone scan, MIBG scan in the skeletal area and distant lymphoid region will be classified as INSS stage 4. Treatments included POG low intensity chemotherapy protocol or high intensity regimens (modified from MSKCC or OPEC). *MYCN* was evaluated by FISH in the University Laboratory.

Results: From Jan 1993 to Dec 2006, a total of 13 patients were diagnosed and treated in the 5 centers (total 134 for all stages, 9.7%). There were 5 stage 4S patients, 4/5 received chemotherapy due to either rapidly enlarging tumors in their visceral organs or cord compression. There were 8 stage 4 patients, all received chemotherapy and 6 under intensive protocols. The median age was 0.28 yrs (range 0.08-0.57 yrs) for stage 4S and 0.7 yrs (range 0 - 0.84 yrs) for stage 4. None of the stage 4S and 30% of stage 4 tested had *MYCN* amplification. 4/5 stage 4S patients survived at a median follow-up of 8.6 yrs (0.1-11.8 yrs). The only mortality was due to hepatic rupture without prior chemotherapy. For stage 4 patients, 6/8 patients survived at a median follow-up of 3.3 yrs (0.1-8.8 yrs). Both fatal cases died of disease progression and they don't have *MYCN* amplification.

Conclusion: In our infant metastatic neuroblastoma cohort, stage 4 neuroblastoma was even more common than stage 4S. All of our survived stage 4S patients required treatment and their long term outcome was excellent. Our stage 4 patients also had better outcome than older children with stage 4 disease.

The Data Managers were supported by the Children's Cancer Foundation of Hong Kong.

Poster Presentation (Doctor's Session)

Two Physical Education Sessions a Week Is Not Good Enough for Adolescents in Hong Kong: A Population-Based Study

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Rationale: Regular physical activity is recommended for the management of high blood pressure in children, although supporting evidence of its benefit is limited.

Objective: To determine the association between blood

pressure and the frequency of structured physical training activity in Chinese adolescents participating in a cross-sectional growth study.

Methods: Nine thousand five hundred and fifty-eight students aged 11-8 years underwent anthropometric and blood pressure measurements. Structured physical training activity was assessed by two simple self administered questions and parents were asked to complete a questionnaire providing demographic information.

Results: Ninety-four percent of the participants provided data on physical training frequency for final analysis. Of the boys, 10.7% and of the girls, 5.3% were physically active with out of school exercise at least 3-times a week. Hong Kong students generally had low level of physical activity, with the standard curriculum having two 45-min sessions for PE class per week and with most students not undertaking any other additional regular exercise sessions. Blood pressure had a positive correlation with BMI. The incidence of hypertension was substantially decreased with increase in training frequency. Logistic regression adjusted for age, family history of hypertension, BMI and sleep duration showed that exercise more or equal to two times a week had a negative relation with hypertension (odds ratio: boys 0.65, 95%CI 0.49-0.86; girls 0.57, 95%CI 0.39-0.83).

Conclusion: Structured physical training activity of two or more times a week has a beneficial effect on blood pressure in Hong Kong children aged 11-18 years.

Urethral Prolapse: A Rare Diagnosis in a Prepubertal Chinese Girl Presented with Painful Perineal Bleeding

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Introduction: Urethral prolapse is a rare condition resulting in perineal bleeding that can be easily misdiagnosed as a case of sexual abuse if the paediatrician has little experience with the condition. It has been reported in the black children but rarely in Asian children We reported a case in a local Chinese young girl and discussed the common presentations, diagnosis and the standard treatment options for the condition.

Case Report: A 7-year-old girl enjoyed good past health and was accompanied by her mother to the hospital for 5 days history of dysuria and a painful vulval swelling with contact bleeding. There was no recent injury to the perineum, no vulval itchiness or vaginal discharge, no retention of urine or abdominal pain. She reported no sexual contact and she remained calm and cooperative throughout the examination.

Physical examination showed an afebrile child with a protruding oedematous fleshy lesion at the upper part of the vulva that measured 1.5 cm in diameter with contact bleeding. The urethral meatus was confirmed at the center of the lesion by Foley insertion. Blood was found in the undergarments and there was no other wound over the perineum. The vaginal opening, hymen and the anus were normal so was the other systems.

Social investigations reviewed no suspicion of sexual abuse although the father had physically abused her elder brothers several years ago. The clinical diagnosis of urethral prolapse was made and the prolapsed urethral mucosa was excised with the urethra repaired under general anaesthesia. Foley was removed 1 day after the operation and her voiding was normal immediately afterwards. There were no recurrence or residual urinary symptoms.

Discussions: Urethral prolapse (UP) is a circular eversion of the mucosa in the urethral meatus, resulting in a doughnut-shaped anterior vulvar mass surrounding the urethral opening with an incidence of 1:3000. It mainly affects prepubertal black girls or postmenopausal white women. As reviewed by Shahab et al in 2009, blood in the undergarment was the most common presenting symptoms for UP and retention of urine was reported in severe cases. Clinical diagnosis could be made by the typical appearance of UP. Differential diagnosis included ureteroele, condyloma and rhabdomyosarcoma. Cystoscopy was seldom needed to rule out ureterocele.

It was hypothesized that the combination of the cleavage plane between the circular-oblique and longitudinal smooth muscle layers in the urethra and an increase in intra-abdominal pressure such as asthma or upper respiratory tract illness gave rise to the prolapse. Obesity might be one of the predisposing factors although no study was able to demonstrate an increase incidence in overweight patients. High rate of recurrent UP had been reported if treated conservatively with sitz bath, local steroid and antibiotics. Surgical excision with urethral repair remained the primary treatment modality. Other methods included ligation over a transurethral catheter with eventual sloughing of the prolapsed mucosa or cryosurgery.

Linear Sebaceous Nevus Syndrome

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Introduction: Linear Sebaceous Nevus Syndrome is a relatively common condition affecting 1 in 1000 live birth. It is defined as congenital lesions consisting of sebaceous nevus with extracutaneous manifestations. Eye, brain and skeleton are the most commonly affected organs. Involvement of cardiovascular system, kidneys and liver has also been reported. Early recognition, thorough investigation and multi-disciplinary care are of utmost importance in

management.

We would like to report a newborn who suffers from linear sebaceous nevus syndrome with an aim to illustrate the importance of early diagnosis & multi-disciplinary care.

Case Report: A near term Chinese baby girl was born by normal spontaneous delivery with a birth weight of 2.74 kg. Her Apgar score was good. Antenatal history was unremarkable and there was no family history of skin problem.

Multiple skin lesions which were salmon to yellow plaques with well defined irregular border and a smooth waxy surface were noted at birth. Scalp, face, trunk and right upper limb were involved. Scalp lesions were deployed of hair. Lesions below shoulder were distributed on right side only. Those on right upper limb were linear in shape. Assessment by Dermatologist affirmed our diagnosis of linear sebaceous nevus syndrome because both sebaceous nevus & extra-cutaneous lesions, namely left upper eyelid lipodermoid and pannus, were present at birth. Additional ***eye lesions*** revealed by Ophthalmologist were left peri-papillary atrophy, left cornea vessels, bilateral prominent iris vessels and right chororetinal coloboma. MRI Orbit gave no additional information.

Active screening for associated anomalies revealed left temporal & parietal lobes atrophy and right temporal & frontal region cortical dysplasia by MRI Brain. ***Neurological*** examination was unremarkable. No convulsion experienced and EEG was unremarkable. ***Cardiac*** team was consulted for screening. Significant juxtaductal coarctation of aorta and small patent ductus arteriosus were diagnosed. Corrective surgery was done uneventfully. At the age of 1.5 months, the patient developed paroxysmal atrial ectopic tachycardia and required the use of anti-arrhythmic agents. Skeletal survey showed no significant ***musculoskeletal*** abnormality and there was no evidence of rickets. Blood test for ***renal and liver*** function was also unremarkable. Screening USG of these organs was arranged.

Discussion: Much evidence is now available to suggest that pathogenesis and clinical expression of linear sebaceous nevus syndrome is related to somatic mutation occurred during the migration of embryonic ectoderm along Blaschko's line. It is believed that the earlier the mutation occurred in development, the more extensive the cutaneous lesion and a greater likelihood of brain, eyes & skeleton involvement. Seemingly unrelated, more mesodermal involvement, resulting in cardiovascular abnormalities, has been increasingly reported since 1966 when Marden & Venters first reported such association. Exact pathogenesis is not well known but mutation of fibroblast growth factor, which functions as an important signaling molecule between epithelial & mesenchymal boundaries, may play an important role. More research on this area is certainly needed.

With the potential for multi-system involvement, patient suffering from linear sebaceous nevus syndrome should undergo multi-system evaluation as soon as possible. Lethal condition could that have been picked up early, just like our patient, and managed before it became critical. Regular follow-up with monitoring of neurodevelopment is mandatory because mental retardation without structural brain abnormality had been reported. Surveillance of malignant skin change should be carried out at each visit for this premalignant lesion. Last but not least, multi-disciplinary approach is the key for management.

Posterior Reversible Encephalopathy Syndrome (PRES): Paediatric Heart Transplant with Cyclosporine Neurotoxicity

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Posterior Reversible Encephalopathy Syndrome (PRES) is associated with a specific disorder of cerebrovascular autoregulation. Clinical features of PRES consisted of headache, decreased consciousness, altered mental functioning, seizures, visual loss or cortical blindness. Characteristic findings on neuroimaging included high signal intensity on T2- weighted as well as DWI MRI images in the posterior cerebral hemispheres, indicative of vasogenic subcortical oedema without infarction. Cyclosporine neurotoxicity had been described following bone marrow and organ transplantation; however, there are few reports of PRES in children especially post paediatric heart transplantation. We report a case of cyclosporine related PRES in a paediatric heart transplant recipient. She made a good recovery with no residual neurological deficits after withdrawal of Cyclosporine, control of possible risk factors as well as symptomatic control of seizure.

Severe Childhood Injuries and Poisoning: Where So They Occur and What Type?

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Background: Injuries and poisoning are important yet avoidable causes of mortality and morbidity in children. In Hong Kong, the paucity of reliable data on childhood injuries has hindered formulation of a prevention program. We hypothesized that there were fundamental differences in mortality and morbidity between indoor and outdoor injuries.

Aim: To review the patterns of severe childhood injuries and poisoning necessitating pediatric intensive care in a regional trauma center.

Methods: We reviewed discharge data of all children who were hospitalized for severe injuries and poisoning at the PICU of a teaching hospital between Oct 2002 and Dec 2008.

Results: There were 86 patients (M:F=2:1). Road traffic injuries (n=19), falls (n=17) and scalds (n=13) were the three leading categories and accounted for 57% of these PICU admissions. Injuries more commonly occurred indoor (63%), and victims of indoor accidents were younger (median age 2.6 versus 8.4 years, p<0.0001), with scalds, poisoning, and foreign body aspiration predominant whereas road traffic accidents predominated in outdoor accidents (Tables 1 & 2). Premorbid neurodevelopmental conditions such as mental retardation, convulsion disorder, or cerebral palsy were only present in indoor accidents. Children in outdoor injuries were generally healthy. Both groups were associated with significant morbidity (mechanical ventilation in 60%, inotrope use in 20%, anticonvulsants in 24%, and neurologic/neurosurgical supports in 49%).

Comparing the three most common categories of patients, there were significant differences in the median age, requirement of neurologic/neurosurgical supports and hospital stay. Although not requiring neurologic/neurosurgical supports, scalds injuries involved the youngest age and required the longest hospital stay.

Conclusions: The causes of severe childhood injuries are heterogeneous. Cardiopulmonary or neurologic/neurosurgical supports are often required. These injuries more commonly occur indoor and involve toddlers with underlying neurodevelopmental conditions. These findings have important implications and serve to heighten public awareness especially on home safety measures in the prevention of childhood accidents.

Table 1 Indoor versus outdoor accidents and injuries in 86 children

	Indoor (n = 54)	Outdoor (n = 32)	P [a]
Median (IQR) age (y)	2.6 (1.2-8.1)	8.4 (6.4–10.9)	<.0001
Males, n (%)	35 (65)	23 (72)	.15
Diagnosis			
RTI	0 (0)	19 (59)	<.0001
Scalds	13 (24)	0 (0)	.001
Falls	11 (20)	6 (19)	.92
Nonaccidental injuries	6 (11)	0 (0)	.08
Ingestion and poisoning	7 (13)	0 (0)	.043
Near-drowning	2 (4)	2 (6)	.63
Foreign body choking or aspiration	7 (13)	0 (0)	.043
AVM bleeds	3 (6)	1 (3)	1.00
Snake bites	0 (0)	2 (6)	.14
Miscellaneous	5 (9)	2 (6)	1.00
Risk factors			
Accident in Mainland China	6 (11)	2 (6)	.70
Prematurity <36 wk	1 (2)	0 (0)	1.00
Neurodevelopmental condition [b]	8 (15)	0 (0)	.023
Management			
Intubation ± mechanical ventilation	34 (63)	18 (56)	.70
Inotropes	12 (22)	5 (16)	.64
Anticonvulsants	15 (28)	9 (28)	.83
Neurological/ neurosurgical support	27 (50)	15 (47)	.95
Outcome			
Died in PICU	5 (9)	1 (3)	.40
ICU stays >7 d	10 (19)	5 (16)	.96
Median (IQR) PICU stay (d) in survivors	2.0 (1.0-5.0)	2.0 (1.3-3.8)	.66
Median (IQR) hospital stay (d) in survivors	10.0 (4.0-27.0)	10.0 (4.0–44.8)	.43

One infant with scald injury was discharged to the burns unit 2 days after PICU admission but was readmitted to the PICU 3 days later for 3 days. All 6 NAI cases had subdural and/or retinal hemorrhages. IQR indicates interquartile range.

[a] Analyzed by χ^2 or Fisher exact test as appropriate, except age, which was analyzed by Mann-Whitney *U* test.

[b] MRCP.

Table 2 Clinical features and outcomes of the victims of 3 commonest causes of childhood accidents who have required ICU support

	RTI (19)	Falls (17)	Scalds (13)	P
Median (IQR) age (y)	9.7 (8.0-11.0)	7.6 (3.3-9.6)	1.6 (0.9-3.0)	<.0001 [a]
Males, n (%)	13 (68)	14 (82)	7 (54)	.24
Indoor	0 (0)	11 (65)	13 (100)	<.0001
Hong Kong	18 (95)	17 (100)	13 (100)	.45
MRCP	0 (0)	3 (18)	0 (0)	.049
GCS at ED <5	3 (16)	3 (18)	0 (0)	.29
Pupils fixed and dilated at ED	0 (0)	0 (0)	0 (0)	N/A
Asystole	0 (0)	3 (18)	0 (0)	.049
Shock	2 (11)	7 (41)	4 (31)	.12
Management				
Mechanical ventilation	13 (68)	8 (47)	4 (31)	.10
Inotropes	3 (16)	4 (24)	1 (8)	.51
Anticonvulsants	7 (37)	7 (41)	0 (0)	.028
Neurological/neurosurgical supports	12 (63)	9 (53)	0 (0)	.001
Death	0 (0)	2 (12)	0 (0)	.16
Median (IQR) ICU stay (d)	3.0 (1.0-4.0)	2.0 (1.0-3.5)	2.0 (1.0-4.5)	.40 [a]
Median (IQR) hospital stay in survivors (d)	11.0 (9.0-55.0)	7.0 (3.0-10.0)	16.0 (8.5-28.5)	.005 [a]

Fourteen (74%) of the 19 RTI victims were pedestrians, 3 were bicycle passengers (2 cyclists and 1 back passenger), 2 passengers in a car. ED indicates emergency department; GCS, Glasgow Coma scale; IQR, interquartile range.

Falls: bus station (n = 1), school (n = 2), shopping mall (n = 2), ground (n = 1), and toilet (n = 1). The rest occurred either in the bedroom or the living room of an apartment.

Scalds: restaurant (n = 1) and kitchen (n = 1). The rest occurred either in the bedroom or the living room of an apartment.

[a] Analyzed by Kruskal-Wallis test for trend.

Hepatotoxicity Associated with Prescribed Medications in Young Infants

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Introduction: Accidental poisonings in infants are relatively uncommon but deserve mentioning. Unlike accidental ingestion due to curiosity in an older child, the poison is usually given by the caregivers in the case of a young infant, and the mother is usually the culprit. We reviewed clinical records of infants with prescribed medications associated with deranged liver function to illustrate the mechanism underlying the occurrence of such events.

Case 1: A 5-month-old 8 kg infant was prescribed paracetamol by a doctor for fever. The mother gave 15 ml instead of 1.5 ml of paracetamol three times a day because she omitted the decimal point on the label of the drug bottle. Three doses of 15 ml (containing 160 mg/5 ml of paracetamol) were given at 2.5 and 11 hours apart, respectively. The estimated total amount of paracetamol given was 1440 mg. The child developed vomiting, diarrhoea and irritability, and was taken to the emergency department for assessment. The serum paracetamol was 70 umol/L at 14 hours following the last dose of paracetamol. The serum alanine aminotransferase (ALT) was 115 IU/L (normal <58 IU/L) on admission and 292 IU/ L 20 hours later. The clotting profile was also deranged with international ratio (INR) of 1.35 (normal: 0.9-1.1) and activated partial thromboplastin time (APTT) 51.9 seconds (normal: 26.2-

40.1 seconds). He was given a full course of 18 doses of oral N-acetyl cysteine (1 gram initially followed by 570 mg 4 hourly) and the ALT and clotting profile gradually normalized.

Case 2: A 2-week-old girl born at 36-week gestation was diagnosed as having oral thrush. She was prescribed oral nystatin (1 ml 4 times per day) for 5 days which resulted in transiently improvement of the thrush. Nevertheless, the thrush recurred from time to time despite that the dosage of nystatin was increased stepwise to 1.5 ml and finally to 2 ml. At 4 months of age, the mother took the infant to see another doctor who prescribed a course of ketoconazole (Nizoral, Janssen Pharmaceutica, Belgium). She did not keep the bottles of these medications and the exact sequence of events and details of dosages of nystatin and ketoconazole were not available. It was presumed that nystatin suspension was 1:100,000 U/ml, and ketoconazole was 50 mg daily for 7 days). The doctor was concerned about possible hepatotoxicity and liver function tests were ordered on completion of the ketoconazole which revealed that the serum ALT was elevated to 169 U/L (normal: 5-25 U/L) and aspartate aminotransferase to 128 U/L (normal: 15-60 U/L). The baby was asymptomatic and ketoconazole was discontinued. Consequently, the infant was referred to a teaching hospital for assessment. On examination, she was not jaundiced, the abdomen was soft and the oral cavity clear. Repeated liver function tests one week later showed that the serum ALT and aspatate aminotransferase had returned to normal and the mother was reassured.

Discussion: These two cases illustrate hepatotoxicity associated with the treatment of two common conditions in infancy. In both cases, the mothers rightly took their children to their doctors for assessment and treatment. Nevertheless, hepatotoxicity developed as a consequence of inappropriate prescriptions. This report serves to alert the doctor to avoid using decimal points in drug labeling and to avoid prescribing excessive amount of drug for trivial acute illness. Thrush in infancy is common and usually treated with oral nystatin. Other oral antifungals such as ketoconazole maybe associated with liver derangement and should be avoided in infants.

Snakebite Wounds

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Introduction: Snakebite injuries in children and young persons have become uncommon in the metropolitan and densely populated city of Hong Kong. Snakebites are rarely fatal but may cause significant morbidity. We report two cases of snakebites to illustrate that spectrum of morbidity are independent of the size of the snakes.

Case 1: A bare-footed 7-year-old boy was bitten in quick successions by a green snake in the New Territories at 6:12 pm in November 2007. The snake first inflicted superficial curved teeth marks on the dorsum of his left foot, followed by two lateral deep fang punctures The boy was rushed to the emergency department of a regional hospital. He did not experience any numbness or pain. Initial blood counts and clotting profiles were normal but became progressively deranged [INR from 1.0 to 1.3 (normal: 0.9-1.1); activated thromboplastin time from 37.4 to 41.5 seconds (normal: 24.2-37.0) and platelet counts $68x10^9$/L (normal: >150)]. The boy and the parents recognized the snake as the "green bamboo" snake (*Trimeresurus albolabris*) with the help of standard identification photographs provided at the Emergency department. The left foot was progressively swollen and bruised, and the dorsalis pedis pulse became weak. When transferred to the PICU, the platelet counts further dropped to $41x10^9$/L. His vital signs were stable. Intravenous antivenom infusion was given with chlorpheniramine and hydrocortisone coverage for precaution of anaphylaxis, and antibiotics for cellulitis. The child rapidly recovered the next day.

Case 2: The lateral right leg (beneath the right knee) of an 18-year-old patient was bitten by a large snake when she was walking in a grassy area in a school campus on an island in the New Territories at 4:30 p.m. in November 2008. The victim was wearing slippers. Apart from the fang punctures on her right leg, the patient did not develop any local or systemic symptoms. She received initial treatment at the emergency department of local hospital and was then transferred to another hospital by helicopter. The patient was observed overnight and did not require any antivenom or antibiotics. The snake was caught later and was identified to be a large non-venomous python.

Discussion: The first case illustrates that a snake may bite in successions and envenomation may occur in a subsequent bite. Therefore, we discourage any attempt by the victim to try to capture the snake for identification. Bites by venomous snakes may result in a consumptive coagulopathy. The second case illustrates that large pythons are typically non-venomous despite their alarming size. Antivenom is not needed for treatment.

In snake bites, human morbidity and mortality rates are low. The outcome depends on the size of the child, the site of the bite, the degree of envenomation, the type of snake, and the effectiveness of treatment. Snakebite injuries in children are relatively uncommon in the metropolitan and densely populated city of Hong Kong. In our review of snakebites over a 10-year period, several risk factors have been identified. Snakebites tend to occur in the evening to early morning hours in the late summer to early autumn months, and on the lower limbs of individuals not wearing trousers or protective footwear.

Conclusion: This report serves to alert the public to

precautions they can take to avoid snakebites such as avoiding areas known to harbour snakes in the evening from summer to autumn, and wearing trousers and protective footwear.

Patterns of Food and Aeroallergen Sensitization in Childhood Eczema

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Aim: To compare the patterns of Typer-1 sensitization of common food and aeroallergens among infants and older patients with atopic dermatitis (AD).

Methods: All skin prick tests (SPTs) performed consecutively between January 2008 and June 2008 on patients managed in the pediatric clinics of a university teaching hospital were reviewed. AD is diagnosed according to Hanifin and Rajka's criteria.

Results: SPT results of 90 patients <18 years of age with AD performed during the study period were analyzed. During the same period, SPTs were performed on 29 patients without eczema (15 urticaria and 14 miscellaneous conditions such as vitiligo, scabies, warts, contact dermatitis etc). The 15 patients with urticaria were compared with the AD patients (Table 1). Dust mite was the most common aeroallergen, and dog dander the least common. Egg white was the most common food allergen, and beef the least common. Dust mite and peanut sensitization was more prevalent in AD than in urticaria. Dust mite sensitization was more prevalent in older children than infants with AD (Table 2). Cow's milk sensitization only occurred in one-tenth of these patients. Prevalence of sensitization to common aeroallergens but not food allergens was generally higher in children beyond 5 years of age.

Conclusions: Milk sensitization is far less prevalent than egg white, and the prevalence does not change beyond infancy. Many infants with AD develop eczema before they show atopy to the common food and aeroallergens. The SPT information is useful in reassuring parents of the unlikelihood of severe Type 1 immediate IgE reaction to some of the common food and aeroallergens so that empirical and multiple food avoidance/restriction can be avoided.

Table 1 Skin prick testing in patients with and without AD

	Urticaria without eczema (n = 15)	Eczema (n = 90)	p*
Mean (SD) age (years)	8.3 (5.0)	6.7 (5.4)	0.251
Male gender	10 (67%)	57 (63%)	0.967
SPT positivity for aeroallergens			
D. pteronyssinus	7 (47%)	68 (76%)	0.047†
D. farinae	7 (47%)	67 (74%)	0.060
Cockroach	2 (13%)	20 (22%)	0.660
Cat fur	2 (13%)	22 (24%)	0.537
Dog hair	1 (7%)	15 (17%)	0.542
SPT positivity for food allergens			
Egg white	3 (20%)	37 (41%)	0.204
Egg yolk	2 (13%)	26 (29%)	0.344
Cow's milk	0 (0%)	11 (12%)	0.329
Peanut	1 (7%)	33 (37%)	0.045‡
Fish	5 (33%)	32 (36%)	0.900
Shellfish/shrimp/crab/lobster	2 (13%)	20 (22%)	0.660
Beef	0	4 (4%)	0.917

SD = standard deviation; SPT = skin prick test.

*Yates-corrected p-values analysed by χ^2.

†Odds ratio [OR] (95% confidence interval [CI]) of *D. pteronyssinus* atopy for AD was 3.53 (1.01–12.49).

‡OR (95% CI) of positive peanut SPT for AD was 8.11 (1.03–172.53).

Table 2 Skin prick testing in patients with AD: <5 years versus ≥5 years

	≥5 year (n = 46)	<5 year (n = 44)	OR (95% CI)*	p
Mean (SD) age (years)	10.9 (4.1)	2.2 (1.4)	NA	<0.0001
Male gender	26 (57%)	31 (70%)	0.55 (0.21–1.42)	0.249
SPT positivity for aeroallergens				
D. pteronyssinus	43 (93%)	25 (57%)	10.89 (2.65–51.76)	<0.001
D. farinae	43 (93%)	24 (55%)	11.94 (2.92–56.69)	<0.001
Cockroach	16 (35%)	4 (9.1%)	5.33 (1.46–21.22)	0.007
Cat fur	18 (39%)	4 (9.1)	6.43 (1.78–25.39)	0.002
Dog hair	14 (30%)	1 (2%)	18.81 (2.36–403.05)	<0.001
SPT positivity for food allergens				
Egg white	15 (33%)	22 (50%)	0.48 (0.19–1.24)	0.144
Egg yolk	8 (17%)	18 (41%)	0.30 (0.10–0.88)	0.026
Cow's milk	3 (7%)	8 (18%)	0.31 (0.06–1.44)	0.172
Peanut	16 (35%)	17 (39%)	0.85 (0.33–2.18)	0.873
Fish	24 (52%)	8 (18%)	4.91 (1.72–14.45)	0.002
Shellfish/shrimp/ crab/lobster	11 (24%)	9 (20%)	1.22 (0.40–3.71)	0.888
Beef	2 (4%)	2 (5%)	0.95 (0.09–10.06)	1.000

CI = confidence interval; OR = odds ratio; NA = not applicable; SD = standard deviation; SPT = skin prick test.

*Represent the respective odds ratios of ≥5 years old for allergen sensitizations.

Serum Lead Levels in Childhood Eczema

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Background: Atopic dermatitis (AD) is a distressing disease associated with pruritus, sleep disturbance and impaired quality of life. The incidence of eczema has been increasing in developed countries. Although air and food pollution (such as with lead) have been considered as possible culprits, these factors have never been investigated in Hong Kong.

Aim: To evaluate if AD severity was associated with abnormal serum lead levels of lead.

Methods: We prospectively measured the serum lead levels in consecutive new patients >1 month of age, and selected existing patients who happened to require blood taking at the pediatric dermatology clinic of a university teaching hospital over an 8-month period. AD is diagnosed according to Hanifin and Rajka's criteria. Correlations between these levels, serum IgE levels as a marker of atopy, eosinophil counts, AD severity (by SCORAD and Nottingham Eczema Severity Score NESS) and quality of life (by Children Dermatology Life Quality Index CDLQI) were also evaluated, long term disease severity by Nottingham eczema severity score (NESS). NESS is a simple and easy-to-perform score which assesses the symptomatology of eczema over the preceding 12 months. A validated Cantonese version is available. NESS was performed on children >1 year of age, and CDLQI on children >5 years. Dietary and traditional Chinese medicine intakes were also screened. Lead levels were measured by inductively coupled plasma mass spectrometry (ICP-MS).

Results: Between July and February 2008, 58 patients with eczema were evaluated. Log-transformed IgE level (as a marker of atopy) was positively correlated with serum lead. Lead levels were generally within normal limits but their levels were positively correlated with poor quality of life (CDLQI: r=0.41 and p=0.003), disease severity (objective SCORAD: r=0.46 and p<0.001; NESS: 0.35, P=0.009) and log-transformed IgE (r=0.342 and p= 0.011 (Table 1). Lead levels, objective SCORAD, and NESS were higher in patients whose parents reported that they had "ever consumed" traditional Chinese medicine (Table 2).

Conclusion: Lead poisoning in children is a serious problem world-wide. Although no children were found to have lead levels beyond local upper limits in our series, the levels were significantly correlated with disease severity and poor quality of life. Chinese proprietary medicines have been reported to be adulterated with heavy metals. Further studies are needed to explore the issue of inadvertent consumption of lead in Hong Kong children.

Table 1 Correlation between clinical parameters and laboratory tests in our patients.

	Objective SCORAD	NESS	CDLQI	Age	Log-transformed IgE
Log-transformed IgE	0.58 (**< 0.001**)	0.41 (**< 0.05**)	0.21 (0.132)	0.31 (0.02)	–
Eosinophil percentage	0.65 (**< 0.001**)	0.41 (**< 0.05**)	0.44 (**0.001**)	0.09 (0.51)	0.57 (**< 0.001**)
Lead	0.46 (**< 0.001**)	0.35 (**< 0.05**)	0.41 (**< 0.05**)	0.05 (0.75)	0.34 (**< 0.05**)

CDLQI, Childrens' Dermatology Life Quality Index; NESS, Nottingham Eczema Severity Score; SCORAD, SCORing Atopic Dermatitis. Results are expressed as Pearson correlation coefficients (P values). Significant P values are in bold.

Table 2 Comparison of clinical parameters and laboratory tests between patients who reported ever using traditional Chinese medicine (TCM) and those who had never used TCM for eczema.

	Use of TCM		
	Ever (n = 30)	Never (n = 28)	P
SCORAD	46.3 ± 21.6	33.1 ± 18.2	0.02
Objective SCORAD	34.9 ± 18.5	24.5 ± 15.8	0.03
NESS	12.4 ± 2.4	10.9 ± 2.6	0.02
Lead	0.10 ± 0.04	0.08 ± 0.03	0.03

CDLQI, Childrens' Dermatology Life Quality Index; NESS, Nottingham Eczema Severity Score; SCORAD, SCORing Atopic Dermatitis. Results are mean ± SD.

Efficacy and Tolerability at Three and Six Months Following Use of Azathioprine for Recalcitrant Atopic Dermatitis

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Introduction: Recalcitrant childhood atopic dermatitis (AD) causes significant morbidity and may necessitate systemic treatment with immunomodulating agents such as Azathioprine. We reviewed the clinical and biochemical effects of this agent in children and adolescents receiving this treatment between November 2005 and December 2007.

Methods: Clinical efficacy of Azathioprine, and its hematological and biochemical effects (serum IgE level, liver and renal function), were assessed at 3 months and 6 months in 17 cases of recalcitrant AD. Disease severity was evaluated with the SCORing Atopic Dermatitis (SCORAD) score which has two components, namely (1) the objective SCORAD which measures the extent (% of body surface area involved) and intensity of the lesions, and (2) visual analog scales which measure the subjective symptoms of pruritus and sleep loss.

Results: There were 9 males and 8 females with a mean (SD) age of 16.1 (3.9) years. Compared with baseline, significant improvements were observed at 3 months (n=17) and 6 months (n=16) in SCORAD (p=0.002; p<0.001), objective SCORAD (p=0.002; p=0.001), extent (p=0.001; p<0.001), pruritus (p=0.004; p=0.001) and dryness (p=0.033 at 6 months) (Tables I & II). Compared with males, objective SCORAD was significantly lower in females (p=0.009) at six months. Azathioprine was stopped in 1 female after 4 months due to lack of efficacy. Serum total IgE (p=0.006) was significantly lower at 6 months. The frequency of oral antihistamine usage and S. aureus carriage were also significantly reduced (p=0.031 and p=0.016, respectively). Mild transient elevation of glutamic-pyruvic transaminase in 1 patient which became normalized on cessation of the drug, and mild elevation of serum bilirubin in 2 other patients were observed.

Conclusions: Azathioprine reduced disease severity of AD within 3-month of use in these children. Better efficacy is observed in the females at 6 months. Adverse hematologic and biochemical effects appeared acceptable but longer term monitoring is desirable.

Table I. Baseline characteristics of the patients treated with azathioprine.

Clinical characteristics	Males (n=9)	Females (n=8)	p
Eczema onset in infancy: 0–1 years old	4 (44.4%)	2 (25%)	0.429
Mean (SD) age, years	17.2 (3.6)	14.7 (4.3)	0.206
Mean (SD) SCORAD	68.2 (6.8)	65.0 (20.0)	0.679
Positive bronchial challenge test	3	4	0.486
Allergic rhinitis	6	1	0.024
Mean (SD) serum total IgE, kIU/l	21 448 (11 482)	19 389 (9916)	0.707
Mean (SD) eosinophil percentage	12.1 (3.3)	10.1 (7.4)	0.502
Treatment tried			
Topical corticosteroids	9	8	–
Systemic corticosteroids	7	4	0.232
Systemic antibiotics	4	5	0.457
Traditional Chinese herbal medicine	8	4	0.079
Oral antihistamine	8	6	0.453
Topical tacrolimus	9	8	–
Phototherapy	1	1	0.929

SCORAD=SCORing Atopic Dermatitis score, which reflects disease activity and symptomatology of pruritus and sleep loss over the preceding 3 days.

Table II. Efficacy at 3 and 6 months.

Clinical characteristics	Males (n=9)	Females (n=8)	p
At 3 months			
Mean (SD) objective SCORAD	46.6 (9.8)	39.1 (16.0)	0.415
Mean (SD) serum total IgE, kIU/l	15 038 (10 474)	16 466 (11 342)	0.825
	Males (n=9)	Females (n=7)	
At 6 months			
Mean (SD) objective SCORAD	46.8 (12.2)	28.4 (11.7)	0.009
Mean (SD) serum total IgE, kIU/l	12 211 (9375)	14 322 (13 141)	0.718

In males, a significant reduction of objective SCORAD from baseline was observed at 3 months (p=0.002) and at 6 months (p=0.034). In females, a significant reduction of objective SCORAD was observed at 6 months (p=0.009) but not at 3 months (p=0.061).

Human Rhinovirus Is the Most Commonly Detected Respiratory Pathogen in Children Hospitalised for Asthma Exacerbation

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Background: Up to 80% of asthma exacerbations in Caucasian children are associated with viral upper respiratory infections. Emerging evidence also suggests human rhinovirus (hRV) to play a crucial pathogenic role in childhood asthma exacerbation. However, such virological data is limited for Asian children. This study elucidated the epidemiology of respiratory infections in Hong Kong children who were hospitalised for asthma exacerbation.

Methods: This case-control study recruited 209 children aged 3-18 years with asthma exacerbations and 77 controls with stable asthma. Asthma diagnosis was made according to American Thoracic Society criteria. Subjects older than 6 years performed online exhaled nitric oxide measurement followed by pre-bronchodilator spirometry. Subjects' nasopharyngeal aspirates were subjected to five groups of nested multiplex polymerase chain reactions that target 20 respiratory viruses and atypical bacteria.

Results: Respiratory pathogens were detected in 105 (51.0%) subjects. The presence of any respiratory pathogen was associated with asthma exacerbation (P<0.001). Specifically, hRV infection was more common among patients with asthma exacerbation (26.2% versus 13.0%; P=0.018). Co-infections with ≥2 organisms was also associated with asthma exacerbation (10.7% versus 2.6%; P=0.030). However, none of these infections was associated with severity of asthma exacerbation (P>0.15 for all). Patients with asthma exacerbation caused by respiratory viruses were younger than those without identifiable viral infections (P<0.05). This finding was attributed mainly to RSV (P<0.005), and influenza A and human metapneumovirus infections (P<0.05 for both). There was no difference in age distribution between cases and controls with other infections including hRV, or with coinfections. During peak hRV season in winter of 2007/08, 46.4% of children with asthma exacerbations were positive for this virus.

Conclusions: Respiratory viral infections are commonly detected in Hong Kong children hospitalised for asthma exacerbation, with hRV being the most important pathogen in our patients. Our data suggests that viral infection is a triggering factor, but does not correlate with the severity, of childhood asthma exacerbations.

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Anti-NMDA-R Encephalitis — An Encephalitis Lethargica-Like Illness

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A girl of 3 years 9 months with a 3 day history of fever and upper respiratory tract infection was admitted with a generalised tonic clonic convulsion, and delirium with screaming and agitation. For the first week after admission, she was lethargic with fluctuating awareness and mutism during the day but poor sleep at night. Workup for acute encephalopathy including autoimmune, infective, toxicology, metabolic and vasculitic screening showed negative findings. ESR was markedly elevated and cerebrospinal fluid showed positive oligoclonal bands. Urgent MRI brain showed bilateral periventricular, multifocal hyperintense lesions on T2W and Flair images over the frontal, parietal and occipital regions without enhancement. Urgent electroencephalogram (EEG) showed generalized slowing compatible with encephalopathy. Acute demyelinating encephalomyelopathy was initially suspected, and she was first given intravenous methylprednisolone (MP) for five days without evident response, and then intravenous immunoglobulin (IVIG) for two days. After this treatment, there was some improvement in conscious level but the child remained mute. Repeated EEG showed improved slowing and sleep changes. In the second week, she developed dyskinesia with mouth chewing, tongue thrushing, finger rolling, and later rigidity, dystonia and oculogyric crises. The dystonia caused mild rhadomyolysis with raised creatine kinase. Encephalitis lethargica was suspected and L-dopa was started. After dose titration, she responded well to L-dopa with improvement of dystonia and rigidity. At the third week, she developed recurrent generalised tonic-clonic convulsions. Phenytoin and Sodium Valproate were started. Repeated MRI brain confirmed increase hyperintensity and size of the previously presented lesions (T2W & Flair images) with additional pons involvement, and evidence of cerebral atrophy. In view of both clinical and radiological evidences of active ongoing encephalitic process, a second course of IVIG followed by MP was given. After the second course of treatment, the child responded well. She regained full consciousness and remained seizure free. After half a month of training, she could walk on her own and recommenced full oral feeding. She had normal understanding and her speech gradually returned two months after onset of illness. As this girl has encephalitis lethargica-like illness, anti-NMDA Receptor (anti-NMDA-R)

encephalitis was suspected. NMDA-Receptor antibodies in both serum and cerebrospinal fluid confirmed raised titres. Ultrasonogram of pelvis was normal.

In summary, this three-year old girl who developed a post-URTI encephalopathy with neuropsychiatric presentation, movement disorder, mutism, sleep disorder and seizures, symmetrical white matter changes, improvement after IVIG and steroids, has anti-NMDA-R encephalitis. Her clinical features were typical of anti-NMDA-R encephalitis (Dalmau et al, Lancet Neurology 2008) which is associated with antibodies against the NR1-NR2 heteromers of the NMDA receptors, and often ovarian tumours in young adult females. The same antibodies have been shown in children with "encephalitis lethargica" (Dale et al, Ann Neurol 2009). This is the first reported case of anti-NMDA-R encephalitis in Hong Kong.

Paediatric Epilepsy Surgery Program in Hong Kong – Experience in Queen Mary Hospital/ Duchess of Kent Children's Hospital

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Background: Surgery is a well established treatment for adults with intractable seizures. Increasingly, infants and children are being considered for epilepsy surgery. In a growing child, epilepsy surgery has the additional benefit of aborting cognitive decline and improving development and behaviour.

Method: The pediatric epilepsy surgery program as well as paediatric video telemetry service were set up in Queen Mary Hospital since the early nineties. From 1998 to 2006, totally, 10 patients were sent overseas for resective surgery. One patient suffered from Rasmussen's syndrome, 3 patients with tuberous sclerosis, 3 with focal cortical dysplasia, 3 with hypothalamic hamartoma. Since 2001, regular epilepsy surgery joint clinic was set up. From 2002 til now, 14 patients underwent curative epilepsy surgery at our centre. One patient suffered from Rasmussen's syndrome, 3 patients with multi-lobar cortical dysplasia, 4 patients with focal cortical dysplasia, 1 with tuberous sclerosis, 2 with dysembryoplastic neuroepithelial tumour, 1 with gliosis, 2 with mesial temporal sclerosis.

Result: Age at operation ranged from 3 months to 19 years. Age from seizure onset to surgery ranged from 2 months to 16 years. Seizure outcome at an average 3.5 years long term follow-up (3 months-7 years) , using Engel's classification, was class 1 in 5 patients (36%), class II in 5 patients (43%), and class III in 3 patients (21%).

Conclusion: With careful case selection, early surgical intervention in paediatric patients with intractable epilepsy is associated with favorable outcome and provides an important opportunity in preventing irreversible decline in intelligence and disability.

Ketogenic Diet Program for Children with Intractable Epilepsy in the Hong Kong West Cluster – 13 Years Experience

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Background: The Ketogenic Diet (KD) is a high-fat, adequate-protein (1 g/kg/day), low-carbohydrate diet that has been used for the treatment of intractable epilepsy since the 1920s. It is calorie restricted and traditionally is started in the hospital after 1-2 days fasting period. It does not cause sedative effects and provides an appealing alternative to other therapies, especially for patients with multiple antiepileptic drugs. KD can be provided as the classical diet, which is more palatable, or with modification using gradually increasing percentages of mediumchain triglycerides, which may potentially induce more gastrointestinal upset and diarrhoea. Glucose transporter 1 deficiency syndrome and pyruvate dehydrogenase deficiency are clear indications for the use of KD. KD can be tried for Epileptic syndromes such as infantile spasm, tuberous sclerosis complex, myoclonic-astatic epilepsy (MAE), severe myoclonic epilepsy of infancy (SMEI or Dravet syndrome), and Rett syndrome.

Methods: We reviewed the KD program provided for children with intractable epilepsy in Hong Kong West Cluster (QMH / DKCH). The Keto-team in HKWC is responsible for counseling and managing patients referred for trial of ketogenic diet. Team members include Child Neurologist, Epilepsy Nurse, dietitian, Clinical psychologist and medical social worker. The self initiated development of the HKWC KD program had gradually evolved as 2 phases-Phase 1 (1996-2002) involving the use of medium chain triglyceride (MCT) diet; Phase 2 (2002 -2009) with the use of classical KD for a more palatable diet and thereby improvement in compliance.

Results: Phase 1 (1996-2002) involved the trial of MCT diet for 10 patients (age 8 months to 16 years). Duration of retention of the KD ranged from 1 month to 2 years. The reasons for discontinuation of KD included poor compliance,

gastrointestional upset and intolerance of the diet with diarrhoea. Phase 2 (2002 -2009) involved the use of classical KD. We actively recruited 24 children with intractable epilepsy for trial of KD Program. However, parents of 16 patients (aged 4 to 16 years) refused to participate into our KD Program. A common reason was the difficulty in preparing Chinese KD meals. Eight patients (aged 21 months to 7 years), were enrolled into our KD program. Most were younger children aged <3 years (n=5) with naso-gastric tube feeding. Of these 8 children, 4 (50%) had been maintained on the classical KD for ≥2 years, with >50% seizure reduction.

Conclusion: In the next phase of development (Phase 3), older children with intractable epilepsy will be recruited. Due to the difficulty in meal preparation, commercially available milk powder will be utilized.

Risk Factors Associated with Refractory Epilepsy in Children – The University of Hong Kong Experience

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Background: There is a lack of consensus about the definition of Intractable or Refractory Epilepsy in Children. Medically intractable epilepsy occurred in 10-20% of epilepsy with childhood onset. Patients with medical intractability had immense resource implication and lifelong disability\ies. Early identification of risk factors for Refractory Epilepsy (RE) offers a chance of appropriate and timely treatment thus affecting prognosis.

Method: We performed a retrospective study for our cohort of 505 children aged below 18 years with new-onset epilepsy, diagnosed between 1979-2006 and actively managed at the Comprehensive Epilepsy Clinic, Department of Paediatrics & Adolescent Medicine of the University of Hong Kong. We arbitrarily defined RE as those who had never been seizure free for more than 12 months despite receiving anti-epileptic drug (AED) treatment. Responders were arbitrarily defined as those who had at least beens seizure free for consecutive 12 months. All patients had been on one or more AEDs and were followed up for at least 24 months after AED initiation. The demographic, clinical, diagnostic, investigative, management and seizure outcome at 2 years were analyzed.

Results: At 2 years follow up, 42% (n=212) had refractory epilepsy. Risk factors significantly correlated with refractory epilepsy included past history of status epilepticus (p<0.001), symptomatic etiology (p<0.001), use of 2 or more AEDs (p=0.001), abnormal neurological comormidities including mental retardation (IQ <70) (p<0.001), learning disabilities (IQ=70-90) (p=0.009), cerebral palsy (p=0.011), abnormalities in EEG (p<0.001) and neuroimaging (p<0.001).

Conclusions: Early identification of risk factors to predict possible medical intractability is important in improving treatment strategies especially in the selection of traditional versus newer AEDs, mono versus poly-pharmacy or even earlier alternative epilepsy management decision plans including evaluation for possible surgical therapies.

Retrospective Review of Secondary Malignancies in a Paediatric Oncology Referral Centre

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Background: With the improvement in treatment strategies of various childhood malignancies, overall survival of these patients improves significantly. Secondary malignancy remains one of the major challenges in long term survivors. In this modern era of management of childhood malignancy, we evaluate the epidemiology of secondary malignancies in long term survivors.

Methods: Retrospective review of patients' database from June 1984 to December 2008. Case records of patients developed secondary malignancies were reviewed. Risk factors of development of this complication were studied.

Results: 1425 new cases were referred to our centre in this 24-year study period. Thirteen cases (9 males; 4 females) developed secondary malignancies. The incidence is about 1%. The most common primary diagnosis is acute lymphoblastic leukemia (n=7); the other primary diagnosis include non-Hodgkin lymphoma (n=2), osteosarcoma (n=1), neuroblastoma (n=1), extracranial germ cell tumour (n=1), retinoblastoma (n=1), Langerhans cell histiocytosis (n=1). Central nervous system tumour (n=4) and therapy-related myelodysplastic syndrome/ acute myeloid leukemia ranks the most common secondary malignancies (n=4); the other secondary malignancies include osteosarcoma (n=2) acute lymphoblastic leukemia (n=1), Wilm's tumour (n=1) and thyroid cancer (n=1). Seven patients died of progression of secondary malignancies. Most of the mortalities are resulted from secondary central nervous system (CNS) tumours and osteosarcoma. The median time between development of secondary and primary malignancies is 6.5 years (range from 2.4-11.5 years) Radiotherapy is a major risk factor for development of secondary malignancies in our cohort.

Conclusion: 1% of our paediatric oncology patients developed secondary malignancies at a median 6.5 years after diagnosis of primary tumours. Radiotherapy is a major risk factor. Patients developed secondary central nervous system tumour and osteosarcoma had the poorest prognosis.

Attitudes of Chinese Parents to Circumcision in Hong Kong

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Aim of the Study: To investigate the prevalence in circumcision in primary school boys, and to study the attitudes to phimosis and circumcision in different socio-economic backgrounds in Hong Kong.

Methods: In December 2008, anonymous questionnaires were delivered to Chinese parents with boys studying in primary schools grade 1 to 6. The participants were asked for the demographic backgrounds, attitudes and beliefs in phimosis and circumcision.

Main Results: 1479 parents responded to the study; 35% were fathers. 10.7% of schoolboys had circumcision done, whereas 11.8% of fathers were circumcised. 28.9% of parents thought that their non-circumcised boys had phimosis and 15.6% of them would consider circumcision. 57.8% of parents would consider circumcision for their boys in public hospitals and 96.9% thought that the public institutes should provide such service. Fathers were more positive about circumcision than mothers ($p=0.016$), especially when they had been circumcised ($p<0.001$). 82.6% of parents thought that the doctors' opinions were most important when deciding for circumcision. Most parents believed that circumcision can prevent balanoposthitis (85.6%) and improve hygiene (84.4%). However, 75.4% of parents opted that prepuce could protect glans penis and 64.7% agreed that prepuce would be retractable before puberty. Parents with lower education level and income believed that circumcision was free of complications; could improve appearance and growth of penis and sexual potency; and could prevent penile cancer ($p<0.001$).

Conclusion: Circumcision is not widely practiced in Hong Kong. However, it can cause potential burdens to surgical services in public institutes. Doctor's opinion is the most important factor for parental decision on circumcision. Thus, education to family physicians is important to correct the misconceptions on phimosis and circumcision, especially for parents in the lower socio-economic class.

Meckel's Diverticulum in Children — 10-Year Experience in a Regional Center

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Purpose: Meckel's diverticulum is the most common congenital midgut anomaly with potential complications. We report the clinical presentations of Meckel's diverticulum in our paediatric population.

Methods: From January 1999 to May 2009, consecutive patients aged <18 with operative diagnosis of Meckel's diverticulum were reviewed.

Results: There were 47 patients with operative diagnosis of Meckel's diverticulum, 40 (85%) of them were boys. Age at presentation varied from 1 day old to 17 years old with median age of 6. Thirteen cases were incidentally found during other abdominal surgery. Among the remaining 34 patients, 14 had gastrointestinal bleeding +/- anemia. Intestinal obstruction, caused by bowel loop kinking, intussusception, volvulus or internal herniation was seen in 14 cases. Meckel's diverticulitis mimicking appendicitis accounted for 6 cases. There were no significant age and gender difference among patients with various clinical presentations. In 14 patients with bleeding complications, Meckel's scan was performed in 13 cases, with a sensitivity rate of 73%. All patients with positive Meckel's scan had heterotopic gastric mucosa in the resected specimen. On the whole, heterotopic gastric mucosa was found in 44% resected Meckel's diverticulum. Twelve out of 14 patients with bleeding complications had heterotopic gastric mucosa, which was significantly higher than those with other clinical presentations ($p<0.001$).

Conclusions: Meckel's diverticulum has various clinical manifestations. A high index of suspicion is necessary to make the correct diagnosis. Gastrointestinal bleeding is common. Meckel's scan is useful to label the heterotopic gastric mucosa.

Urological Associations in Anorectal Malformations in Local Chinese Population – A Fifteen-Year Review

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Purpose: To review on the urological associations and their management in anorectal malformations (ARM) in local population.

Methods: Patient-records from a single paediatric surgical center from 1995 to 2009 were reviewed.

Results: 105 paediatric patients with ARM were identified. 32% had urological associations. Hydronephrosis (14%) and vesicoureteric reflux (11%) were the commonest. Incidences in our cohort also included: renal dysplasia 4.8%, solitary functioning kidney 2.9%, pyeloureteric junction obstruction 1.9%, ureteric ectopic 1.9%, urethral duplication 1.0% and others. Overall, 13% had major urological associations, 40% of which had VACTERL syndrome. High-type ARM was associated with major urological anomalies (P<0.01). Overall 8.6% had neurogenic bladder, 78% of which had tethered cord or sacral anomalies. 9.5% had major urological anomalies which necessitated operations. Two patients with VACTERL and high-type ARM were dialysis-dependent.

Conclusion: We presented the spectrum of urological associations in Chinese ARM patients. The overall incidence is similar to Caucasians. Early complete urological and spine workup are mandatory in all newborns with ARM, especially if the malformation is high-type or has other VACTERL association.

Long-Term Outcome of Survivors of CRRT in Children

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Introduction: With the advancement in medical technology, various modalities of CRRT became feasible in children. However, their impact in modifying the long-term outcome of survivors is not well studied.

Methods: We retrospectively reviewed our patients who had CRRT between January 1998 and December 2008. Their outcomes were reviewed at 6 months, one year after CRRT and at last follow up. Late survivors were defined as survival beyond one year after CRRT.

Results: In the study period, 37 patients were recruited. Twenty-one patients (57%) survived the acute event (38.5% from neonates and 61.5% from paediatrics). The mean weight at CRRT in the paediatric group was 24± 15.7 kg (range: 8-54 kg) and in the neonatal group was 2.55±0.74 kg (1-4 kg). During the acute event, multi-organ failure was the commonest indication for CRRT in neonates (80%) and carried a poorer prognosis (p=0.06) whereas primary renal disease accounted for 29% of CRRT in paediatric group and it had the most favourable short term outcome (p=0.038). Neonatal patients had a higher pre-CRRT fluid overloads than paediatric group (11.68±9.83% versus 4.12±5.15% with p=0.004). At 6 month after CRRT, 4 patients died of their underlying diseases, 4 patients were still receiving dialysis therapy and survived the acute event. Twelve patients had normalized their renal function. One patient was followed less than 6 months and was excluded from further review. At the one-year assessment, three more patients died, making a total of 7 deaths (33.33%) in the first year after CRRT among the early survivors. Thirteen patients (62%) survived beyond one year after CRRT. The mean duration of follow up of these late survivors was 5.5± 2.6 years. At final assessment, 62.5% survivors from paediatric group versus 20% in neonatal group were in CKD stage II-V. None of late survivors from neonates was dialysis dependent.

Conclusion: With the support of CRRT, patients survived the acute life-threatening event but 1/3 of them still succumbed within the first year and was related to their underlying diseases. Although neonatal patients had a higher mortality at the initial presentation, their late survivors had a better long term outcome in renal function as compared with paediatric group Monitoring of renal function in the survivors was recommended as it might continue to deteriorate years later.

The Epidemiology of Bacteremia in Paediatric Cancer Patients With Febrile Neutropenia in Hong Kong

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Background: There is a changing pattern of pathogens and emerging resistance due to liberal use of broad spectrum antibiotics in febrile neutropenia. The study of local epidemiology is crucial in updating institutional-based treatment protocol. Ceftazidime monotherapy is used as the standard treatment protocol for febrile neutropenic cancer patient in our center.

Objectives: (1) To describe the epidemiology and resistance pattern of bacteremia in febrile neutropenia; (2) To evaluate the appropriateness of current empirical antibiotic treatment protocol; (3) To identify predisposing factors for particular organisms

Methodology: Patients who admitted to paediatric oncology centre of Queen Elizabeth Hospital between May 2001 and May 2008 with fever, neutropenia and positive growth in blood culture are recruited.

Results: A total of 70 episodes of Bacteremia were identified in 43 patients in the study period. A increasing trend of gram-negative organisms was noted, from 40% (12/30) in 2001-2004 period to 52.5% (21/40) in 2005-2008 period. Among gram-positive organisms, *Bacillus species* (18.2%) and *Staphylococcus albus* (15.2%) were the most common. Among gramnegative organisms, *Escherichia coli* (33.3%) and *Klebsiella pneumoniae* (18.2%) were the most common.

The susceptibilities of gram-positive organisms towards beta-lactam were low. Susceptibilities of cloxacillin, ampicillin and penicillin were 60% (9/15), 26.3% (5/19) and 34.8% (8/23) respectively. Among all gram-negative organisms, only 13 (65%) of them were sensitive to ceftazidime during the whole study period. Such susceptibilities were observed to be decreasing from 75% in 2001-2004 period to 58.3% in 2005-2008 period. This is closely related to the emergence of extended-spectrum beta-lactamase (ESBL). On the other hand, amikacin enjoyed a reasonably high susceptibilities rate of 82.1% (23/28).

Underlying disease, duration and severity of neutropenia, use of antibiotic prophylaxis or steroid, infective focus are not associated with the type of organism.

Conclusion: In contrast to worldwide trend, gram-negative bacteremia is increasingly more common. Ceftazidime monotherapy may be insufficient as the empirical antibiotic due to rising resistance among gram-negative organisms. Moreover, most gram-positive organisms are resistant to beta-lactam. Therefore, the combination of beta-lactam/beta-lactamase inhibitor and an aminoglycoside, is a reasonable choice that cover most of the pathogens causing bacteremia in our paediatric oncology centre.

Effects of Chelators (Desferal, Deferiprone & Deferaairox) on the Growth of Klebsiella and Aeromonas Isolated from Transfusion Dependent Thalassemia Patients

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Infection is among the leading causes of death for thalassemia major patients. The known predisposing factors of infection include prior splenectomy, iron overload and use of iron chelator such as desferal (desferrioxamine). While encapsulated organisms frequently found in splenectomized patients were readily controlled by prophylactic vaccination and vigilant antibiotic treatment, ferrophilic organisms such as Yersinia and Klebsiella remains common among Thalassemic patients. The inductive iron overloaded environment favours the growth of these organisms but their growth is also affected by the environment temperature. For example, Yersinia infection is more prevalent in temperate regions and Klebsiella infection is commonly found in subtropical areas. Furthermore, the use of iron chelator in the form of desferal further aggravates the risk of Yersinia infection. It is because the iron membrane transport protein siderophore found in desferal can be adopted by the bacteria for iron acquisition. However, oral chelators such as deferiprone do not enhance growth of Yersinia *in vitro* or *in vivo*. In order to find out whether such observation can be extended to Klebsiella and Aeromona infection, *in vitro* culture assay using Klebsiella pneumoniae and Aeromonas hydrophila obtained directly from our transfusion dependent thalassaemic patients were performed. The growth rates of the bacteria under iron rich, iron poor with or without different chelators were assessed. The growth rates were analyzed by both: (1) optic density of bacterial broth; and (2) colony count by bacterial agar plate. We found that the growth of Klebsiella was marginally enhanced by desferal *in vitro* when compared to Yersinia. Such unfavourable effect was not found in either deferiprone or deferasirox *in vitro*. On the other hand, the growth of Aeromonas was not affected by the presence of any of the 3 chelators. Therefore, we suggested that factors other than desferal may account for the increase prevalence of Klebsiella and Aeromonas infection among Asian thalassemic patients. It also suggests that oral chelators are safe for thalassemic patients during febrile illness. Unlike desferal, withholding iron chelator during infectious period may not be mandatory. But care has to be exercised especially for patients on deferiprone, since neutropenia has to be ruled out during febrile illness.

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Oral Presentation (Nurse's Session)

Extending Ventilator Circuit Change from 7 Days to 14 Days in a Neonatal Intensive Care Unit

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Introduction: Ventilator associated pneumonia (VAP) is one of the most common nosocomial infection in Neonatal Intensive Care Unit (NICU) in Hong Kong. It is associated with increased mortality and length of stay. In the past, ventilator circuit were thought to be one of the main factors in causing VAP and ventilator circuits were changed frequently. Changing of ventilator circuit occupies a large volume of nursing time. Now it is well known that VAP is mainly associated with aspiration of the contaminated oropharyngeal secretions or esophargeal reflux from the stomach. Researches in adult population favoured less frequent changes too.

Intervention: The use of ventilator circuit were extended from 7 days to 14 days for both invasive (intubated) and non-invasive (nasal Prong) ventilation from February 2007.

Aim: The aim of this study is to test whether extending

the circuit change will affect both the VAP and nosocomial pneumonia rate associated with ventilator use.

Method: Data were collected prospectively for twelve months from October 2007 to September 2008. Data was then compared with historical control of babies with invasive and non-invasive ventilation in 2006. Disposable circuit with singe heater wire and heated water chamber were used. Nosocomial pneumonia was always monitored continuously by an infection control nurse from the infection control department and infection link nurse from the ward. Nosocomial pneumonia was diagnosed according to clinical and laboratory evidence.

Results: During the study period, 24% of ventilator circuits were used longer than 7 days within which 13% were used for 2 weeks. 128 patients were in the invasive control group whereas 109 patients were in the study group. Ventilator Associated Pneumonia (VAP) rate were 10.12 and 8.6 in the control and study group respectively but it was not statistically significant. 152 patients were in the non-invasive control group and 151 patients were in the study group. Nosocomial pneumonia rate were 0.68 and 2.44 in the control and study group respectively and it was again not statistically significant. Costs of ventilator circuit can be saved between 16,000 to 36,000/year.

Conclusion: It is safe to extend ventilator circuit use from 7 days to 14 days. Extending the circuit use also reduces manpower as well as supply costs.

The Impact of Cancer on Hong Kong Chinese Children's Physical, Emotional and Psychological Well-Being

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Introduction: The diagnosis and treatment of cancer is a stressful and threatening experience, which can be emotionally devastating to children. Despite the improved prognosis, the course of cancer treatment has tremendous impact on children. Therefore, the present study aims to shed light on the impact of cancer on the physical, emotional, and psychosocial well-being of Hong Kong Chinese children, and to discuss how nurses can help ease the burden of cancer treatment for children.

Methods: A cross-sectional study was employed. Hong Kong Chinese children admitted for treatment of cancer in two paediatric oncology units of two different regional acute public hospitals were invited to participate in the study. A total of 98 children were recruited during a 10-month period in 2008. Participants were asked to respond to the Chinese version of the State Anxiety Scale and the short version of the Center for Epidemiologic Studies Depression Scale during hospitalization. Besides, a brief semi-structured interview was conducted with each participant before discharge home.

Results: Results from this study indicate that children scored considerably high state anxiety on admission and more than half of the participants presented some depressive symptoms during the stay in hospital. Moreover, semi-structured interviews indicated that nearly all children expressed different degrees of sadness, unhappiness and worry.

Discussion and Conclusions: This study has addressed a gap in the literature by examining the impact of cancer on the physical, emotional and psychosocial well-being of Hong Kong Chinese children. The study has found some commonalities of experience in children with cancer in both the Western and Hong Kong Chinese context. Regardless of sex, age or type of cancer, this study reveals that cancer has tremendous impact on children's physical, emotional and psychosocial wellbeing. There is an imperative need for nurses to evaluate appropriate nursing interventions that can help children resume their normal growth and development, in particular to help them ease the physical, emotional and psychological burden of life-threatening disease.

Surmounting Barriers One After Another Over the Long Journey – Lived Experience of Mothers of ELBW

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The birth of a child conveys expectations, new challenges and responsibilities, and the start of a new phase of life for the infant and mother. Yet, the birth of a premature infant is represented in previous reports as a traumatic, stressful and insecure time-dependent process to the mothers. Studies pertaining to the western culture have reflected a long standing interest on the impact and stress on the families perceived by the parents of very low birth weight children, little attention has been given to the mothers' lived experience in caring for an extremely low birth weight (ELBW) child during the preschool years in the Chinese culture.

This hermeneutic-phenomenological inquiry attempted to uncover the mothers' experience of living with ELBW preschool children. The purpose of this study was to describe and interpret the mother's experience so as to provide health care professionals with an increased understanding and insight about this experience.

Twelve mothers were recruited for in-depth interviews that were audiotaped and transcribed verbatim. Supplementary information from field notes was also used

to enhance understanding of the mothers' experience. The process of analysis was guided by the methodological process of a nursing inquiry adopted from Ray (1991), together with the phenomenological hermeneutic ideas from van Manen (1990). The process of data analysis was cyclic and summarized into three core phases. The first phase aimed for a naive understanding of the text. The second phase was the structural analysis composed of descriptive reflection and interpretive reflection to elucidate the experience of mothers. In the third phase, the text was considered as a whole again to obtain a critical understanding of the experience. From the mothers' narrations, seven metathemes emerged through deep reflection and they are:

- *Transforming in Corporeal - Embodying Motherhood*
- *Changing in Temporal - Living with Uncertainty*
- *Changing Relationships - Shaping the Caring Labyrinth*
- *Interacting with the Environment - Anticipating and Intervening*
- *Getting To Know and Understand*
- *Asserting Life in Pending Loss*
- *Transcending to Spirituality*

In concert with the metathemes and themes central to this experience of extremely-lowbirthweight, a metaphor: *Surmounting barriers one after another over the long journey* emerged. Further reflecting on the metathemes and metaphor, the unity meaning: *A Meaning of Life: Each Day a New Day* was revealed.

This research suggests an imperative notion that nurses and healthcare professionals should emphasize a holistic care approach engaging into the mothers' psycho-social-spiritual world so as to get a closer focus on to the complexity of their needs. Recognizing the experiential knowledge of mothers, healthcare professionals should involve mothers as partners within caring interactions and decision-making. Nurses are encouraged to maintain an intersubjective relationship with the mothers to achieve mutual planning of care with mothers in facilitating their care management of ELBW children at preschool age.

An Experimental Study on the Use of Manual Pressure to Reduce Pain in Neonates During Heel Prick

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Objectives: Manual pressure over the needle stick site could inhibit the transmission of pain by 'closing the gate' to decrease nociceptive transmission of pain associated with heel stick. The aim of this study is to determine the effects of gentle manual pressure applied to needle stick site immediately prior to heel stick on pain responses assessed by the Neonatal Infant Pain Scale (NIPS) (primary outcome), heart rate, respiratory rate and oxygen saturation (secondary outcomes) in infants who required a heel stick.

Methods: This randomized, open labeled, crossover trial with healthy, term neonates 3-8 days old excluded those with diseases other than physiological jaundice; has congenital abnormalities, bodily measurements (body weight, length and head circumference) not within normal range according to growth chart; consumed analgesic/ sedative within 48 h in significant quality or quantity; or used sucrose or breast-milk shortly before heel prick. After informed consent, 9 infants received 10 sec of gentle manual pressure over the needle stick site immediately prior to heel stick on the first study sampling and no manual pressure on the next sampling. Eight infants had the reverse order. The researcher measured NIPS during the heel prick. Heart rate, respiratory rate, and oxygen saturation was measured prior to massage and 1 min after heel stick.

Results: In 17 infants, there were no adverse physiologic effects of manual pressure. During heel prick, the NIPS were significantly lower ($p=0.01$) under the manual pressure condition compared with the no manual pressure condition. Heart rate, respiratory rate, and oxygen saturation were in general not significantly different between the two conditions.

Conclusion: Gentle manual pressure over the needle stick site prior to heel stick is safe and decreases pain responses in preterm infants.

Adolescent and Parental Perceptions of Medical Decision-Making in Hong Kong

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Objectives: To investigate if Chinese adolescents in Hong Kong share similar perceptions with their Western counterparts regarding their capacity for autonomous decision-making, and secondarily if Chinese parents underestimate their adolescent children's desire and capacity for autonomous decision-making.

Method: "Healthy Adolescents" and their parents were recruited from four local secondary schools, and "Sick Adolescents" and their parents from the pediatric wards and outpatient clinics, and their perceptions of adolescents' understanding of illnesses and treatments, maturity in judgment, risk-taking, openness to divergent opinions, pressure from parents and doctors, submission to parental authority and preference for autonomy in medical decision-making are surveyed by a 50-item questionnaire on a five-point Likert scale.

Results: Findings indicate that Chinese adolescents 14-16 years of age perceive themselves to possess the necessary cognitive abilities and maturity in judgment to be autonomous decision makers similar to their Western counterparts. Paradoxically, although they are hesitant to assert their autonomy, they are also unwilling to surrender that autonomy to their parents even under coercion or intimidation. Parents tend to under-estimate their adolescents' abilities and preferences to make autonomous decisions and over-estimate the importance of parental authority in decision-making.

Conclusion: "14-and-above" Chinese adolescents in Hong Kong perceive themselves to be capable of autonomous decision-making in medically-related matters, but they hesitate to assert their autonomy probably because of the Confucian values of parental authority and filial piety that are deeply embedded in the local culture.

Integrated Patient Care Plan in the Management of Acute Asthmatic Attack

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Introduction: Asthma is one of the most common chronic illness among children and takes a significant toll on children. If not properly managed, asthma can cause life-threatening crisis and increased hospitalization. There are evidence that when proper medical treatment and asthma education are provided, many patients will be able to lead normal and active lives. With the implementation of the in-hospital integrated patient care plan (IPCP) protocol since March, 2006, asthmatic children and their families become competent in the care of their illness.

Objectives: Our IPCP protocol particularly focuses on: (1) Prompt relief of respiratory distress of acute asthmatic attack; (2) Early identification of severe cases for aggressive treatment and monitoring; (3) Provide education to family members and children on the use of medications and disease management in the care of asthma.

Methodology: A prospective study was carried out between March to June 2009. Children admitted to paediatric wards aged over or equal to 2 years old with the principle diagnosis of asthma were recruited. All patients were treated according to the IPCP. Outcome measures were (1) the incidence of acute asthmatic attack requiring intensive care, (2) percentage of subjects received a nurse-led education talk, (3) results of self-administered questionnaire assessing their knowledge in understanding their own illness. (4) assessment on the technique of using inhalation devices, (5) unplanned readmission rate within 28 days due to asthmatic exacerbation, (6) the mean days of hospitalization.

Results: From March, 2006 to June 2009, 671 children were recruited, aged 2-17, and results were analyzed, 231 (34.42%) were female, and 440 (65.5%) were male, mean age was 5.75. There were 5 children requiring PICU care. 70.6 % received post asthma education talk. All patients showed satisfactory result in the self-administered questionnaire and in the use of inhalation device. The unplanned readmission rate was 0 to 1.82% per year, (versus 8% in the pre care plan period). The mean day of hospitalisation was 2.27.

Conclusion: The IPCP protocol is effective in reducing unplanned readmission. It is also effective in improving patients' knowledge of asthma and correct use of inhalers.

Poster Presentation (Nurse's Session)

Understand How Children Cope with the Diagnosis and Treatment of Cancer: An Important Step to Implement Appropriate Psychological Interventions

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Introduction: Understanding how children cope with the diagnosis and treatment of cancer is a crucial step toward designing appropriate psycho-educational interventions. This paper aimed to explore how Hong Kong Chinese children cope with the diagnosis and treatment of cancer, an area of research that has been underrepresented in existing literature.

Methods: A cross-sectional study was employed. Eighty-eight Hong Kong Chinese children aged 9 to 16 years, admitted for treatment of cancer in 2 paediatric oncology units, were invited to participate in the study. A one-to-one short interview was conducted. Content analysis was used to analyze the interview data. The differences in coping strategies used between children's sex and age group were assessed by using chi-square test.

Results: Findings from this study indicated that the most commonly reported coping strategy used by Hong Kong Chinese children was self-control (emotion-focused). This finding is incongruent with previous studies on Western children in which it was found that seeking social support (problem-focused) was the most commonly reported coping strategy. On the other hand, this study revealed that children used different coping strategies at different developmental stages, with younger children used less problem-focused and more emotionfocused coping strategies than older children.

Discussion: The diagnosis and treatment of childhood cancer have been described as extremely stressful and threatening experiences in the life of a child. This study has addressed a gap in the literature by examining how Hong Kong Chinese children coped with and responded to the diagnosis and treatment of cancer. It is anticipated that the information derived from this study would help nurses to shape and design appropriate psycho-educational interventions that can help ease the burden of cancer treatment and provide support for childhood cancer survivors to flight cancer and its subsequent adverse treatment effects at every step of their long and difficult journey.

Survey on Adolescent Health Problems and the Effectiveness of Adolescent Talks

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Introduction: Recent extensive report on substance abuse by adolescents in different mass media has drawn great public attention. This only reflects part of the adolescent problems. In the frontline, nurses undoubtedly play an important preventive and remedial role. Hospitalization of adolescents often offers a good opportunity for nurses to see to the underlying problems and do the health education.

Methods: A questionnaire-based survey titled "Survey on Adolescent Health Problems and the Effectiveness of Adolescent Health Talks" was conducted to understand how adolescents assess their own health problems before and after health talks from September 2004 to March 2009. An evaluation was also performed on the effectiveness of health talks.

Results: The surveys mainly focused on three different aspects i.e. self identity and self image, stress management and prevention of drug abuse. The overall response rate was 100%. The sample included 83 adolescents. The age range was from 10-18 years old. The participants were invited to attend different health talks. In the first aspect including four talks: "Love Yourself", "Keep Fit Formula", "Fitness by Healthy Diet" and "Acne Care" were conducted to understand the "self identity and self image" of the adolescents. It was found out that 62% of the participants expressed that "Self Understanding" was important to them. 100% of the participants were not satisfied on their body shapes. 50% had attempted weight reduction before. 80% adolescents chose junk foods as most preferred foods. 44% adolescents had trouble with acne. 33% answered that they would squeeze the acnes. None of the participants would seek medical advice.

The second aspect on stress management included two topics: "Goodbye to Stress" and "Positive Thinking". 86% adolescents expressed that they had stress in their daily lives. The origin of stress was mainly from academic performance (55%). The methods used to cope with stress included: sleeping (30%), watching T.V. /listening to music (18%) etc. "Lost of family member" (37%) were found to the most unhappiest event. The coping strategies included: chat with someone (38%), eating (16%) etc. 13% adolescents were willing to talk with the medical staff. Therefore, nurses played a significant role to help them.

In the third aspect on substances abuse preventive health talk, 100% adolescents could give the correct answers on the adverse effects of substances abuse. All participants reported that they would not abuse substances when being asked by friends or relatives.

In general, for all talks, 89% adolescents reported that the health talks were useful to them. 34% adolescents said that they would apply the knowledge gained in the health talks to their daily lives. 33% adolescents said that they had increased health knowledge after the talks.

Discussion and Conclusion: Results from this study indicate that self-identity and self-image are some of the main adolescent concerns. Having limited knowledge, adolescents usually adopt incorrect methods to deal with their problems, for example, inappropriate managing their acnes. Therefore nurses should play a vital role to health promotion, such as teaching them correct methods in treating the acnes. The study also showed the effectiveness of health talks. Positive feedback from adolescents further supports the role of the nurses in providing health education for adolescents.

The Correlation Between Parental Fever Phobia and the Daily Routine of Fever Management in Paediatric Ward

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Introduction: The symptoms and signs of a febrile response are the most common presentation of illness in childhood. A number of reports have shown that the condition of undue fear about the danger of fever lead to excessive use of health care services. A term "fever phobia" is used to describe the exaggerated fear of fever due to misconception. This phenomenon has been found among parents of all socioeconomic classes and different ethnic groups. In Hong Kong, insufficient knowledge of fever management also exists in Chinese culture; aggressive treatments for the fever children are expected by the parents. Especially in private health care sectors, the parents have more autonomy to influence the fever management practices. Lots of complaints and dissatisfaction have occurred because of the different beliefs of fever management practices

between the parents and the health care providers. The frequency of temperature taking is one of the main concerns. For the improvement of customer service, it is imperative to collect the information for the development of an educational programme for fever management.

Objectives: This study aims to (1) explore the needs for developing an evidence-based educational programme by collecting data about the proportion of time consuming on fever management in daily work (2) acknowledge the parental concerns and expectation of clients regard to fever management through systematic literature review (3) identify what elements are essential to develop an educational programme for fever management in a private sector in order to enhance customer service.

Method: This study is the first phase of the pending educational programme for fever management. A systematic literature search for the parental anxiety is conducted by using the electronic database: MEDLINE, CINAHL as well as some other search engines such as Yahoo and Google. The collected data will be adopted as a framework for developing the questionnaires of parental misconception survey in the next phase of educational programme. Simultaneously, patient data such as admission rate, rate of fever cases, fever patterns and so on are collected by a team of reviewers independently to investigate the needs of providing an educational programme. The results are submitted to the hospital administration for the approval of developing this programme.

Result: In reviewing the patient data from record office from August to September, the admission rate of Paediatric patient was 471. The rate of fever cases is 294 out of 391 (75%). Their mean body temperature was around 39°C on admission. During hospitalization, 38.2% fever cases had been performed hourly temperature taking for 6-8 hours until fever down for the first 2-3 days after admission. The remaining 61.8% patients were either performed Q2H or Q4H temperature taking until fever down. Around 60% patients had been given the ice pads and 22.3% patients required tepid sponging for the management of high fever within hospitalization.

Eight studies were selected after the literature search. They all compared the level of parental anxiety and misconceptions of childhood fever. Fever phobia existed in different countries and ethnic groups, the level of misconceptions and phobia did not have much improvement for the past 20-30 years. Most of the parents still had knowledge deficit on fever management; there were fewer differences when associated with their educational background and socioeconomic status.

Discussion: According to the finding, it may have 6 to 10 patients on hourly temperature taking everyday that is similar to the daily routine of the ward. Every temperature taking requires 5 to 6 minutes including recording and administrating medication if necessary; not includes tepid sponging. If there are 10 patients on hourly temperature taking, it may take an hour to finish. It means that the ward has to spend one of the manpower for the hourly temperature taking only. It shows that fever management spends a large portion on daily work in this ward; it is worth to have further exploration in this issue. The result from literature review are summarized and analyzed for developing the questionnaires of parental misconception survey later.

Conclusion: Parental fear and misconception of fever have been widely investigated. Since no such investigation has been done in Hong Kong private sector before, these data are worth to show the fever phenomenon among children for certain extend. That is the reason to explain the significance of literature review for this program. It can help the health care providers to explore much more the parental concerns so as to allot colleagues for further fever management to patients. Therefore, preparing nurses with updated fever management by knowledge-based literature are the next crucial steps for this educational programme.

An Experimental Study on the Use of Manual Pressure to Reduce Pain in Neonates During Heel Prick

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[1]Department of Paediatrics, Alice Ho Miu Ling Nethersole Hospital; [2]The Hong Kong Polytechnic University, Hong Kong

Objectives: Manual pressure over the needle stick site could inhibit the transmission of pain by 'closing the gate' to decrease nociceptive transmission of pain associated with heel stick. The aim of this study is to determine the effects of gentle manual pressure applied to needle stick site immediately prior to heel stick on pain responses assessed by the Neonatal Infant Pain Scale (NIPS) (primary outcome), heart rate, respiratory rate and oxygen saturation (secondary outcomes) in infants who required a heel stick.

Methods: This randomized, open labeled, crossover trial with healthy, term neonates 3-8 days old excluded those with diseases other than physiological jaundice; has congenital abnormalities, bodily measurements (body weight, length and head circumference) not within normal range according to growth chart; consumed analgesic/ sedative within 48 h in significant quality or quantity; or used sucrose or breast-milk shortly before heel prick. After informed consent, 9 infants received 10 sec of gentle manual pressure over the needle stick site immediately prior to heel stick on the first study sampling and no manual pressure on the next sampling. 8 infants had the reverse order. The researcher measured NIPS during the heel prick. Heart rate, respiratory rate, and oxygen saturation was measured prior to massage and 1 min after heel stick.

Results: In 17 infants, there were no adverse physiologic

effects of manual pressure. During heel prick, the NIPS were significantly lower (p=0.01) under the manual pressure condition compared with the no manual pressure condition. Heart rate, respiratory rate, and oxygen saturation were in general not significantly different between the two conditions.

Conclusion: Gentle manual pressure over the needle stick site prior to heel stick is safe and decreases pain responses in preterm infants.

The Experiences of Hong Kong Chinese Women with Breastfeeding

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Introduction: There is no doubt that breast milk is the best natural food for infants. The evidence-based, immediate and long-term health benefits of breastfeeding for infants and their mothers are well recognized. International and local health organizations make enormous efforts to promote breastfeeding. The rates of women who initiate breastfeeding in Hong Kong have risen substantially over the past decades. However, most Hong Kong women stop breastfeeding before the recommended 6 months postpartum. The explanation for early cessation of breastfeeding is complex and multifaceted.

Methods: In this study, a qualitative approach was employed to explore and describe the experiences of Hong Kong Chinese women with breastfeeding, across the time periods during pregnancy and after delivery. A purposive sample of 12 Chinese pregnant women with breastfeeding intention was invited to participate in the study. In-depth, semi-structured interviews were conducted during late second trimester of pregnancy (20-22 weeks of gestation); late third trimester of pregnancy (34-36 weeks of gestation); immediate postpartum (Day 2-5) during hospitalization and at six weeks after delivery.

Results: After content analysis of the interview data, four main themes emerged. These include: intention to start breastfeeding; the ups and downs in breastfeeding; adjusting to breastfeeding; and stop breastfeeding or supplementation. This study describes the embodied experiences of breastfeeding at various time periods and highlights the unique cultural and social factors influencing breastfeeding practices of the contemporary Hong Kong Chinese women. In addition, recommendations are made for the healthcare professionals and organizations to modulate the breastfeeding supports in order to meet the needs of Hong Kong Chinese women.

Preventing Patient Fall: A Retrospective Study on Fall Incidence in Paediatric and Adolescent Ward

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Introduction: There is a growing concern of patient safety in modern hospital. Fall is regarded as the one of the top ten risk and the fall incident rates have deserved great concern from health care professional. Actually falls in hospital can have significant impact on patients' well being, health care expense and pose a substantial increase in staffs' workload. Fall prevention programme have been implemented in adult ward but not in paediatric. There is no documented study regarding the fall incidence, the prevalence and fall related factors in hospitalized children in Hong Kong.

Objectives: (1) To minimize the fall incidents in paediatric ward; (2) To determine the characteristics and fall related factors in order to predict the high risk group of fall; (3) To determine fall preventive strategies.

Methods: All fall incidents report via Advanced Incidents Reporting Systems from 2005 to May, 2009 were reviewed and analyzed. SPSS program was utilized for descriptive statistics.

Results: Total 44 cases were reviewed and analyzed. 34 cases (77.3%) fell in the presence of their parents or relatives. Age < 4 years old constituted 33 cases (75%) and patients of neurological disorder constituted 7 cases (16%) of fall. The most common location of fall were within bed and bedside areas and constituted 26 (59.1%) cases. 21 (47.7%) cases fell off the bed, of which 57.1% cases forgot to put up the side rail and 28.5% raised their side rail to half level. 4.7% pulled up side rail without firmly locked. Most of the fall occurred in the day time and evening. 11 cases (25%) of fall occurred at 1700-1900. The types of injuries were laceration (13.6%), hematoma (25.9%) abrasion (2.3%) and bruise and redness (20.5%).

Recommendation: All patients are assessed the risk of fall on admission. If patients fall within <4 years old or have neurological disorder will atomically become high risk group. Educational program is instituted and geared toward educating families the risk of fall and emphasized the need to put up side rail to the highest level.

Conclusion: Its hope that the implementation of fall prevention program based on this study can significantly reduced the incidence of fall and a high quality of care can be attained.

Integrated Patient Care Plan in the Management of Acute Asthmatic Attack

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Department of Paediatrics and Adolescent Medicine, Tuen Mun Hospital , Hong Kong

Introduction: Asthma is one of the most common chronic illness among children and takes a significant toll on children. If not properly managed, asthma can cause life-threatening crisis and increased hospitalization. There are evidence that when proper medical treatment and asthma education are provided, many patients will be able to lead normal and active lives. With the implementation of the in-hospital integrated patient care plan (IPCP) protocol since March, 2006, asthmatic children and their families become competent in the care of their illness.

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