Methods: To determine the duration of VRE colonization among renal carriers colonized during an outbreak of VRE in SGH in March 2005. Renal carriers (41 of 176 carriers) who had end stage or chronic renal failure or renal transplant were identified from the hospital database and contacted for the study from 1st July to 31st December 2007. VRE cultures from rectal swabs were obtained with consent at least a month apart and up to a maximum of 3 swabs per patient. Pulsed-field gel electrophoresis (PFGE) was performed to determine whether recurrent VRE strains were the same clone as the previous colonizing strain. The duration of VRE persistence was calculated as the interval between the initial positive culture during the outbreak and the last positive culture identified during the study.

Results: Of 109 (67 had died) VRE carriers, 41 were contactable of who 9 refused. Sixteen of 32 were renal patients who had 30 follow-up cultures. The first follow-up culture, collected a mean of 978 days (range 706 to 1333 days) after the initial positive isolate, was negative in 94% (15 of 16). In the sole positive patient (6%), PFGE confirmed the same clone as the previous colonizing strain. After 1 negative follow-up culture, the next one was negative in 90% of the patients (9 of 10; 1 refused second swab). After 2 negative cultures, 83% remained culture-negative (5 of 6; 1 refused third swab). There was no difference in persistent VRE carriage between renal and non-renal VRE carriers (each 1 of 16; persistent duration of 912 and 864 days respectively).

Conclusion: Like non-renal VRE carriers, the majority of renal carriers may be cleared by 3 sequential negative cultures at least a month apart impacting favourably on limited isolation facilities. Given this small study, caution should be exercised especially in those who continue to have hospital admissions and antibiotic use. Perhaps active surveillance for VRE should continue even in renal patients cleared of VRE status.

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40.074

Combating Endemic Diphtheria in a Tropical Metropolis: A Matched Case-Control Study in Ho Chi Minh City, Vietnam

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Background: From 1999 to 2004, Ho Chi Minh City (HCMC), Vietnam, reported 401 clinically suspected diphtheria cases, comprising 72% of the national incidence. Toxigenic *C. diphtheriae* was isolated from 90 of the samples. To identify risk factors for endemic diphtheria in the city, particularly the cut-off level of diphtheria toxoid, a matched case-control study was conducted from September 2005 to January 2006.

Methods: Cases were defined as those occurring in HCMC who were hospitalised and given a discharge diagnosis of diphtheria in the Hospital for Tropical Diseases, HCMC, during 2003—2004. In total, 88 cases and 352 age- and sex-tionnaire.

Results: Among the variables investigated, immunisation and bathing status showed a statistically significant association with diphtheria incidence. Those who had not had DPT/DT immunisation were more likely to develop diphtheria than those who had completed three doses (odds ratio, 9.9 [95% CI, 1.9—52.3]). Those who received four or more doses did not show any further decreased risk. Those bathing only once a day or less often were more likely to develop diphtheria than those bathing twice or more (OR 1.7 [95% CI, 1.0-2.9]). Estimated vaccine efficacy of three or more doses of diphtheria toxoid adjusted by bathing status was 88%.

Conclusions: Identifying and reaching out to children with DPT0 status, rather than the introduction of booster doses, and the promotion of skin hygiene are the priority public health interventions in terminating the lingering endemicity of diphtheria in HCMC.

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40.075

Clinical Features of Neutropenic Fever in Korea, a Single Center Study (2003—2008)

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Objective: It is important to know the epidemiologic features in community to proper use of empirical antibiotics in neutropenic fever. The features of neutropenic fever has not been studied in Jeju island, Korea. So we evaluated the clinical features of neutropenic fever in Jeju island according to change of time.

Materials and Methods: We retrospectively reviewed medical records of 61 patients (68 cases) who were diagnosed as NF in Cheju national university hospital from June 2003 to January 2008. Clinical features during the 1st period (from June 2003 to Dec 2006) were compared with those during the 2nd period (from Jan 2007 to Feb 2008).

Results: Mean duration of recovery from neutropenia was 2.84 days and absolute neutrophil count (ANC) on the first day of NF (or a date of admission) was lower than 100/mm^3 in 29 cases (42.6%). 28 cases (41.2%) belonged to the high-risk group of the NF. Mean duration of fever after admission was 2.15 days. Infections were classified as 10.3% of microbiologically defined infection (MDI), 51.5% of clinically defined infection (CDI) and 38.2% of unexplained fever (UF). Most common site of infection was respiratory tract. In 7 cases of MDI, 6 of gram-positive bacteria and 1 of gram-negative bacteria were isolated. During the 1st period, 3 of gram-positive bacteria and 1 of gram-negative bacteria were isolated, and they were meticillin-sensitive *S. aureus* (MSSA), meticillin-resistant coagulase negative staphylococci (MRCNS), *Viridans streptococci*, and *Sphingomonas paucimobilis*. During the 2nd period, 3 of gram-positive bacteria were isolated and they were MRCNS, penicillin-sensitive *S. pneumoniae* and penicilln-resistant *S. pneumoniae*. As an empirical antibi-

otics, Piperacillin/Tazobactam was most commonly used (23 cases, 33.8%) and Cefepime was next. (20 cases, 29.4%). Successful response to initial antibiotics was 5 cases (72.4%) in MDI, 30 cases (85.7%) in CDI, and 24 cases (92.3%) in UF. Mortality rate was 4.4% and all death was related to infection.

Conclusion: There were no evident differences of clinical features between the 1st period and the 2nd period. But we found two specific clinical features. The rate of successful response to initial antibiotics was the highest in UF (92.3%). It means that we need to change or add the empirical antibiotics if we could guess the site of infection rather than use the recommended antibiotics in 2002 IDSA guidelines. And extremely high portion of gram-positive bacteria (85.7%) were isolated compared with other clinics in Korea. We think it might be an unique clinical feature in Jeju island. In the future, empirical antibiotics that cover the gram-positive bacteria for NF may need to be routinely used in Jeju island.

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Cloning and Characterization of *hem*A Gene of *Vibrio cholerae* O139

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The *hem*A gene of *Vibrio cholerae* encodes for glutamyl tRNA reductase, an essential enzyme for the synthesis of aminolevulinic acid (ALA), which is a precursor in heme biosynthetic pathway. In this study, we have cloned and characterized the *hem*A gene of *V. cholerae* O139. The *hem*A gene was initially isolated from the wild type (WT) O139 *V. cholerae* as a 1,259 bp gene fragment (GenBank accession number: AF 227752). The *hem*A gene was adjacent to *hem*M gene with 159 bp intervening segment. The *hem*A gene was cloned in pHIS expression vector to obtain a 50kDa recombinant *hem*A gene product, i.e, glutamyl tRNA reductase. The recombinant glutamyl tRNA reductase was expressed in pHIS vector and purified using IMAC chromatography. An antibody against recombinant glutamyl tRNA reductase was raised in mice and rabbits. The anti glutamyl tRNA reductase antibody reacted specifically to the 50kDa protein. The *hem*A mutants were ALA auxothroph and were able to grow on LB and TCBS agar supplemented with ALA and also on blood and chocolate agar. The growth of the *hem*A mutants on blood and chocolate agar indicated that the exogenous hemoglobin could partially supports the growth of ALA mutants. The *hem*A mutants of *V. cholerae* were successfully complemented with a plasmid encoding *hem*A gene, indicating the role of *hem*A gene in ALA auxotrophy. ALA/PBG assay was used to study the synthesis of ALA in *hem*A mutants. It was observed that the level of ALA was decreased in *hem*A mutants when compared to WT. The *hem*A mutants' motility was reduced and biofilm formation was enhanced when compared to the WT. In conclusion, we have characterized and confirmed the role of *hem*A gene of *V. cholerae* in ALA biosynthesis.

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40.077

Typhoid Ileocolitis - Endoscopic Aspects

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Background: Typhoid ileocolitis ulcerations occur more commonly over rich lymphoid areas in the intestine. *S. typhi* in Peyer's patches of ileocecal region spread proximally running along marginal arteries, which explains lesser severity of lesions distally in the colon. The colon is involved in only a third of cases and rarely extensively.

Methods: Typhoid ulcerations are ovoid with the largest diameter parallel to the long axis of the gut, with soft, swollen, irregular, not undermined edges, looking umbilicated, ulcerated mounds ("punched-out" ulcers), with a white base and furry appearance, surrounded by normal-appearing mucosa.

Results: Typical aspects of ulcerations of typhoid ileocolitis are presented, along with microscopic aspects of biopsies.

Discussion: Colonoscopy is only advised when the diagnosis of typhoid is doubtful, or for endoscopic therapy in cases of hemorrhage for which conservative attitude or surgery is not indicated. Differential diagnosis of endoscopic ulcerations of typhoid includes *Y. enterocolitica*, *Mycobact. tuberculosis*, *E. hystolytica*, Campylobacter, other Salmonella, *Aerom. hydrophilia*, *H. capsulatum*, CMV in AIDS, Beçhet's disease, NSAID use. Serious complications of typhoid ulcerations are severe hemorrhage when an ulcer erodes into a blood vessel, and transmural perforation leading to peritonitis. Colonoscopic diagnosis can be helpful in some cases for an early diagnosis, favoring more quick treatment of typhoid fever, with lower number of complications.

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40.078

Efficacy of Initial Treatment of Purulent Meningitis with Ceftriaxone and Adjunctive Dexamethasone

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Primary goal of the study was to appraise the influence of the duration of cephalosporins usage on its efficiency in the treatment of purulent meningitis (pm). In order to assess efficacy of initial antimicrobial monotherapy with ceftriaxone and adjunctive dexamethasone two compared consecutive five year periods (1998—2002 and 2003—2007)