Gavin M. Joynt
Wong Wai Tat

Ten diseases you need to know if you want to be a critical care specialist in Hong Kong

Received: 24 April 2014
Accepted: 30 April 2014
Published online: 14 May 2014
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G. M. Joynt (✉)
Department of Anaesthesia and Intensive
Care, The Chinese University of Hong
Kong and Intensive Care Unit, Prince of
Wales Hospital, Shatin, Hong Kong, China
e-mail: gavinmjoynt@cuhk.edu.hk

W. W. Tat
Intensive Care Unit, Caritas Medical
Centre, Kowloon, Hong Kong, China

The Hong Kong Hospital Authority provides a high standard of intensive care for residents at nominal cost. The territory-wide mean predicted risk of hospital death by APACHE III-j score is 26 %, with a risk-adjusted hospital mortality of 0.8, and hospital median and mean length of stay 2.1 and 4.2 days [1]. While excellence in diagnosis and supportive care remain the cornerstone of ICU management internationally, practice in Hong Kong presents some special challenges.

Severe acute respiratory syndrome (SARS)

For Hong Kong intensivists, the SARS epidemic remains a defining memory. Of 8,098 cases worldwide, 1,755 (784 health-care workers) occurred in Hong Kong. The ICU burden was high—383(22 %) admissions, average length of stay 10 days, and ICU mortality 42 %.

Key lessons included the need for strict infection control measures to protect staff, particularly the provision and correct use of personal protective equipment (PPE), and careful management of staff stress [2]. Ineffective antiviral agents led to the empirical use of unproven therapies, some subsequently associated with unfortunate consequences like osteonecrosis in patients

who received high-dose steroid [3]. The consequence of unplanned, rapid overexpansion of ICU facilities was associated with excessive staff infection rates and compromised ICU function. Advice on how to expand ICU facilities was published in light of this experience [4].

Influenza

The tradition of purchasing live poultry places dense populations of birds and humans in proximity, and live poultry markets have been identified as reservoirs of novel influenza, including H5N1 and H7N9 [5]. Consequently, Hong Kong experiences sporadic cases/clusters of novel influenza, either locally acquired or from mainland China. Mortality from novel influenza is high, and intubation, tracheal suction, and bronchoscopy carry high risk of transmission. Identifying high-risk patients by TOCC (recent travel, occupational exposure, contact history—including live poultry—and clustering) screening is mandatory. Routinely, ICU admissions with infective respiratory disease are isolated (airborne precautions), and remain so until screening for influenza viruses by ELISA and RT-PCR is complete, and informed decisions can be made.

Tuberculosis

Tuberculosis remains common (incidence 86/100,000 population), especially compared to Western Europe and North America [6]. Mortality of mechanically ventilated patients is high (up to 60 % in one Hong Kong ICU, personal communication, WWT), as is health-care worker transmission risk (17 cases in 2011) [7]. Ensuring early, adequate respiratory airborne isolation, coupled with rapid and efficient TB screening to facilitate early de-isolation and early therapy is critical. Anti-bacillary therapy carries significant risks and new molecular tools (e.g. real-time DNA amplification assays of sputum) allow rapid diagnosis, differentiation of TB from non-tuberculous mycobacteria, and genotypic tests for antibiotic resistance. The rate of MDR-TB (1 %) remains relatively low [7].

Scrub typhus

Scrub typhus, caused by *Orientia tsutsugamushi*, is an endemic zoonotic rickettsial fever. History of hiking, visits to semi-rural areas (transmission is by trombiculid mite larva bite), fever, rash, and hepatitis with raised transaminases are diagnostic clues, but the presence of an eschar (often hidden in skin folds or under hair) is strongly suggestive. Scrub typhus presents as disseminated vasculitis, with perivascular inflammation and capillary leakage, and ICU admission is usually precipitated by ARDS, shock, or multi-organ failure, including AKI [8]. The diagnosis is missed if not suspected and sought. An early trial of tetracycline (doxycycline) is recommended in suspected cases, as delayed therapy is associated with deterioration and multi-organ dysfunction [8].

Necrotizing fasciitis caused by Vibrionaceae

Vibrio vulnificus bacteria are endemic in the warm estuarine/seawaters around Hong Kong, and global climate change has been blamed for increasing infections worldwide [9]. Necrotizing soft-tissue infection occurs following open wound contact, or systemic sepsis after consumption of contaminated seafood. Classic features include fever, septic shock, violaceous bullous skin lesions (Fig. 1), plus known risk factors (consumption of raw fish, especially bivalves, or seawater contact within 1–5 days, especially in patients with hepatic disease or immunocompromised). Disease progress is rapid. After blood and tissue cultures are obtained, immediate therapy with doxycycline plus third-generation cephalosporin or quinolone, and emergent necrotic tissue debridement may minimize mortality [10].

Hospital-acquired infections

Methicillin-resistant *Staphylococcus aureus* (MRSA) is endemic and routine mandatory screening and surveillance programs exist in all ICUs. While MRSA rates appear acceptably stable, the increasing occurrence of carbapenem-resistant *Acinetobacter baumannii* remains a challenge [11]. Identification of colonized or infected patients, and compliance with contact precautions, including single-room isolation, is commonly practised.

Nasopharyngeal carcinoma

The incidence of nasopharyngeal carcinoma in males (19/100,000) is more than ten times higher than the world average [12]. Radiotherapy remains standard treatment, but causes long-term pathological changes in the airway, fibrosis of the temporo-mandibular (TM) joints, tongue, neck muscles, and osteonecrosis of the TM area. Pulmonary aspiration syndromes are common, as is difficulty with airway management. Fibreoptic-guided intubation is frequently required.

Oesophageal carcinoma

The high incidence in the male population (10/100,000), about six times the world rate, results in frequent elective post-operative ICU admissions. The major causes of early post-operative death are pulmonary complications, anastomotic leakage and atrial fibrillation, myocardial ischaemia, or cardiac failure. Early extubation, thoracic epidural analgesia for adequate pain control, and

Fig. 1 Typical skin lesions in a patient with necrotizing fasciitis from *V. vulnificus* infection. Over 70 % of infected individuals have distinctive bulbous skin lesions, and mortality in Hong Kong is 30 %

aggressive chest physiotherapy may reduce ICU length of stay and complications [13].

Hepatocellular carcinoma

Chronic hepatitis B infection with associated liver cirrhosis and hepatocellular carcinoma is common. Non-traumatic hemoperitoneum from spontaneously “ruptured” tumour is an important cause of acute haemorrhagic shock, and easily missed if not suspected. Emergency trans-arterial chemoembolization is a first choice for bleeding control, followed by open radiofrequency ablation [14]. Emergency hepatic artery ligation, plication, packing, or hepatectomy may be required. Correction of coagulopathy caused by liver cirrhosis is also important post-intervention.

Traditional Chinese medicine (TCM) toxicity

Severe toxic effects of TCM (herbal, animal, and mineral agents) are uncommon, but the extensive use of TCM in Hong Kong where 20 % of all doctor consultations are by TCM practitioners, means that toxicity is not uncommonly observed. Direct toxicity or detrimental pharmacological interactions depend on the agent’s natural properties (often enhanced by decoction), inadvertent contamination (poor quality control), or deliberate adulteration (e.g. added steroids, non-steroidal anti-inflammatory agents). Unexplained findings, especially cardiac, hepatic, and/or renal failure should always prompt a thorough history of TCM use, and appropriate toxicology investigation to inform therapy and prognosis [15].

Conflicts of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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