Prevention of Healthcare Associated Infection

Prevention and control of infection program is a multidisciplinary systematic approach committed to prevent health care associated infections (HAI) and their related events in order to improve patient care and to minimize infection –related occupational hazards associated with the delivery of health care. One out of 20 hospitalized patients acquire a HAI. Out of 100 hospitalized patients in 7 developed countries and 10 in developing countries have a HAI. These infections are associated with increased mortality varying from 80,000 fatalities in the USA to 4m in Europe yearly. Estimated cost for these infections is more than 30 billion per year. According to the WHO, in low to middle-income countries the frequency of ICU-HAI is at least 2-3 times higher than high income countries. Device-associated infections are 13 times higher than in the USA. In developing countries the rates of HAI are higher than in high income countries the frequency of ICU- HAI is at least 2-3 times higher than high income countries. Device-associated infections are 13 times higher than in the USA. In developing countries the rates of HAI are higher than in high income countries the frequency of ICU- HAI is at least 2-3 times higher than high income countries. Selective pressure exerted by antimicrobial use, transmission and persistence of the resistant strain is determined by many factors:

1. Availability of vulnerable patients.
2. Selective pressure exerted by antimicrobial use.
3. Increased potential for transmission from large numbers of colonized or infected patients (‘colonization pressure’).
4. Impact of implementation and adherence to prevention efforts.

Patients at risk of colonization and infection include those with severe underlying disease, especially if immunocompromised; recent surgery; or indwelling medical devices (e.g., urinary catheters or endotracheal tubes). ICU patients, at higher risk than non-ICU patients, and have the highest infection rates. For example, the risk that an ICU patient will develop VRE colonization or infection increases significantly once the proportion of ICU patients colonized with VRE is above 50% or the number days of exposure to a VRE-patient exceeds 15 days. A similar effect of colonization pressure has been shown for MRSA in a medical ICU. Increasing numbers of infections with MDROs have also been described in non-ICU areas of hospitals. There is abundant epidemiologic evidence to suggest that MDROs are carried from one person to another via the hands of HCPs. Hands are always contaminated during the process of care-giving or from contact with environment in close proximity to the patient particularly when patients have diarrhea and are colonized with MDRO in the gastrointestinal tract. Therefore, without adherence to hand hygiene and glove use healthcare professionals (HCP) can transmit MDROs to patients. When a patient has an MDRO related infection, the consequences are numerous. Transmission occurs initially in the hospital, but it extends beyond that. There are ample opportunities for transmission of MDROs beyond the acute care hospital because patients receive care at multiple healthcare facilities and move between acute-care, ambulatory and/or chronic care, and long term facilities. Options for treating patients with these infections are often extremely limited making treatment very difficult with lower success rates. This causes increased length of stay and increased costs, and increased mortality (4-5).

Several factors may have contributed to the spread of MDROs mainly inadequate adherence to infection control practices and inappropriate use of antibiotics. Our only chance in fighting the spread of these infections is prevention. Prevention is a strategy that mandates supportive administrative policies, a well-established and properly applied and monitored Infection control program, a comprehensive antimicrobial stewardship program together with proper staffing and continuous education to the healthcare givers and the public (5). The main principles of infection prevention are basically identifying risks for colonization or infection with resistant organisms, screen for such organisms when needed, properly isolating patients with such organisms. An infection control program should establish procedures related to prevention mainly hand hygiene and aseptic techniques, bundles for specific infection preventions, and environmental cleaning procedures according to internal standards as demonstrated in the diagram of the five pillars of infection control below (figure 1). Finally, it cannot be emphasized enough that safe healthcare is everyone’s responsibility: HCPs, healthcare facilities, public health officials, consumers, payers and patients, this is an era where all are urged to collaborate for the safety of our patients.