Rajiv Gandhi Cancer Institute & Research Centre

Newsletter

Vol. XIV No. 11 Price : 50 Paisa Issue : Nov. 2011

SECTOR-V, ROHINI, DELHI-85 • Tel. : 47022222 (30 Lines) 27051011-1015, Fax : 91-11-27051037

EDITORIAL

Infection Prevention Vs Infection Control

Over the past few years, there has been an increased recognition of the quality and cost implications associated with health care associated infections. Now infection prevention has been thrust into spot light with regards to patient safety, financial accountability and regulatory readiness.

Infection control was in its infancy in 1970's. Awareness of hospital acquired infections increased in late 1980's and early 1990's. It was realized that surveillance and reporting of infections to surgeons reduced the rate of SSI (Surgical Site Infection) for all procedure classes. Simple calculation of rates of SSI provided minimal information for surgeons, instead rates of SSI should be risk stratified and benchmarked for specific procedures. SSI leads to an excess of health care resource expenditure, patient suffering and death. Improved adherence to evidence based preventive measures, particularly those related to appropriate anti microbial prophylaxis can decrease rate of SSI. Diagnosis may be sometimes difficult in general. Aggressive surgical debridements in combination with effective antibiotics are needed to optimize the treatment of SSI.

Progress in medical therapies has been significant but has brought difficult challenges like acquisition of multi resistant pathogens. Control of MRSA in health care setting is an important public health issue that has become a subject of increasing public and political interest. There is a shifting paradigm towards infection prevention rather than infection control. There is a significant pressure on the experts in the field of infection prevention to achieve zero rates of Hospital Acquired Infections (HAIs).

Approximately 1 in 10 hospitalized patients will acquire an infection after admission, resulting in substantial economic cost. The primary cost is that patients with hospital-acquired infections have their stay prolonged, during which time they occupy scarce bed-days and require additional diagnostic and therapeutic interventions. Estimates of the cost of these infections (2002) suggested that the annual economic burden was $6.7 billion per year in the United States and £1.06 billion (approximately $1.7 billion) in the United Kingdom.

To illustrate the Cost implications of Infection Prevention Vs Infection Control, let us go through a following example:

The average cost per infection is as follows:

Type of Infection	Average Cost Per Infection (INR)
Wound infections	50000.00
Sternal/Bony infections	300000.00
Catheter-associated bloodstream infection	80000.00
Pneumonias	150000.00
Urinary Tract Infection	15000.00

Whereas when we look at the Cost of a well established Infection Prevention programme in a 250 bedded hospital, it surmounts to:

- Manpower (One Infection Control Nurse, One dedicated IC Officer) = 12 lakhs annually
- Infrastructure related to Infection Control = 4 – 5 lakh
- Supplies (Hand rubs, Masks, Gloves, gum boots, waste bins etc) = 10 lakhs annually.
- Training Programmes = 2 lakhs
- Various displays = 2 lakhs
- Miscellaneous = 1 lakh

Recurring cost = 25 lakhs/annual

It has been observed that 32% of HAIs can be prevented by effective infection prevention programs.

- Various studies suggest that hospitals without effective programs actually have a rise in Hospital Acquired Infections from 9 to 31%, but effective programs reduce HAI rates from 48% to 7% in the same period.

Suggestions - We should have our vision and mission statement of provision of safe quality patient care with no patient in ICU acquiring ventilator associated pneumonia.

We should have infection prevention programs including best practices with sterilization, asepsis, handling of medical devices, antibiotic policy and hand hygiene. It has been proven that simple measures like hand hygiene is associated with a reduction in HAIs practice.

Every institution should have infection prevention nurse and microbiologist for infection prevention. There should be surveillance with feedback to health care workers.

The organization should delegate authority and responsibility for infection control programme to IPPC (Infection Prevention and Control Committee). IPCC should be central decision making and policy making body where primary purpose is to advocate for infection prevention and control. IPPC should have the authority to take immediate action if patient, visitor and healthcare worker safety is endangered with regard to infection prevention.

Society as a whole would benefit from reduced incidence of hospital acquired infections and reduced transmission of highly resistant pathogens within healthcare institutions. The Buzz word should be **"Infection Prevention"** rather than **"Infection Control".**

Dr. A. K. Dewan
Medical Director

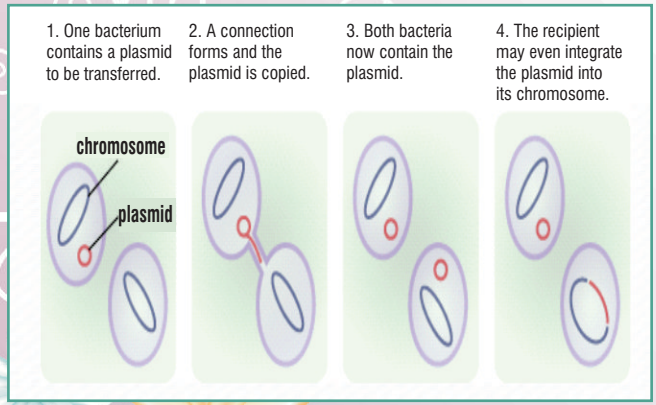
SUPER BUG INFECTIONS

For a long time, India has been seeing Extended Spectrum Beta-Lactamases (ESBL), which are enzymes that have developed a resistance to antibiotics like penicillin. ESBL enzymes are most commonly produced by two bacteria - E coli and K. pneumonia. "These were treated by a reserved class of antibiotics called carbapenems. There is a new bug belonging to family Enterobacteriacae named "SUPER BUG" in the town that can spread rapidly and it is extremely immune to antibiotics.

SO WHAT EXACTLY IS THIS BUG ?

It is called superbug NDM-1.that stands for (New Delhi metallo-beta-lactamase-1). It is named after the national capital, where a Swedish patient was reportedly infected after undergoing a surgery in 2008. A carbapenem-resistant Klebsiella pneumoniae strain, bearing the novel gene NDM-1 was identified. Since then there have been several cases reported in the UK. In 2009, the health protection agency in the UK issued an alert on the 'gram negative' bacterial infection that is resistant to even the most powerful and reserved class antibiotics called Carbapenems and the bacteria was named as CRKP (Carbapenem resistant klebsiella) or CRE (Carbapenem resistant Enterobacteriacae) The Lancet shows NDM-1 is widespread in sewage and drinking water outside the hospital environment in Delhi, India.

What makes the superbug more dangerous is its ability to jump across different bacterial species. So far, it has been found in two commonly seen bacteria, E coli and K pneumoniae. "We have found that the superbug has the potential to get copied and transferred between bacteria, allowing it to spread rapidly. If it spreads to an already hard-to-treat bacterial infection, it can turn more dangerous. The widespread use of antibiotics both inside and outside hospital is playing a significant role in the emergence of resistant bacteria. (Super bug)



Pathogenicity :

- The most common infection caused by this bacteria outside the hospital is pneumonia, typically in the form of bronchopneumonia and also bronchitis. These patients have an increased tendency to develop lung abscess, cavitation, empyema, and pleural adhesions. It has a high death rate of about 50% even with antimicrobial therapy.
- In addition to pneumonia, super bug can also cause infections in the urinary tract, lower biliary tract, and surgical wound sites.
- The range of clinical diseases includes thrombophlebitis, cholecystitis, diarrhea, upper respiratory tract infection, wound infection, osteomyelitis, meningitis, and bacteremia and septicemia.
- If a person has an invasive device in the body then contamination of the device becomes a risk and sepsis and septic shock can follow entry of the bacteria into the blood.

Mechanism :

Gram-negative bacterias are more difficult to treat with antibiotics even without being drug resistant because they have more structural challenges. For example, they have two outer membranes, so antibiotics have to get through two separate barriers to target them effectively. They also contain multiple efflux pumps that pump out toxic substances, such as antibiotics.

CRKP strains contain enzymes that destroy the carbapenem. The huge problem, though, is the company that [CRKP] keeps. They are alongside other bacteria that are already multidrug resistant and they contain genetic elements, pieces of DNA, that can be transferred to those other bacteria. ***Klebsiella pneumoniae*** can transfer the genetic material of their resistance and have already done so in the case of ***E. coli*** hospital-associated infections.

Are CRE dangerous?

They can be, because they are found in hospitals, and can cause infection in people who are very sick. Patients in intensive care units are at greatest risk, especially if they are on ventilators and have central intravenous catheters in place.

Transmission to other patients?

CRE can be transferred from the patient to the environment and to the hands of the care provider (doctor or nurse or other person) when the care provider touches the patient or touches the patient with medical equipment, then touches another patient.

What can be done to prevent super bug?

Stay out of the hospital and nursing homes! -- Not possible

Are you likely to go out and get infected on the street? - Chances are low.

The spread of NDM-1 within health-care facilities can be curbed through strict infection-control measures, including patient isolation and hand washing.

Hospitals use ***"standard precautions"*** for all patient care activities. Standard precautions means that healthcare personnel wash their hands before they touch a patient and after they finish caring for the patient, and they wear gloves and a gown for patient care activities that might result in exposure to blood or body fluids.

If a patient is infected with CRE, additional infection control measures are taken. These are called ***"contact precautions".*** The patient is usually placed in a private /isolated room. The care provider wears gloves and a gown any time he/she is in the patient's room. The patient must stay in the room and visitors may be restricted.

Education : Inform staff, visitors, and patients about infection prevention steps.

Surveillance : Conduct active surveillance which includes environment sampling & testing of patients exposed to the CRE-positive patient

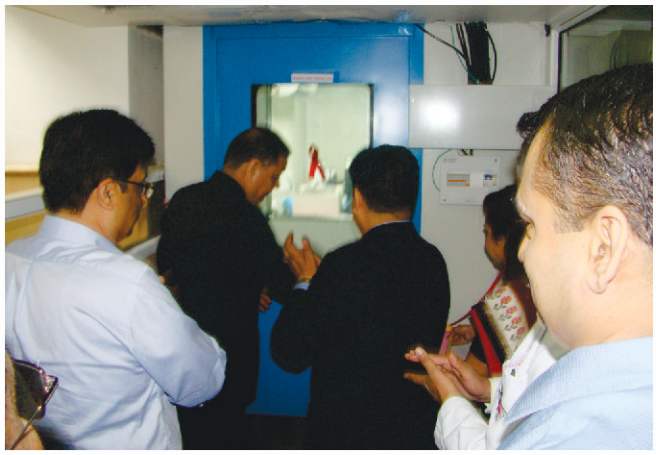
If you or your family members are hospitalized, you should follow instructions for hand washing and other infection control measures as requested.

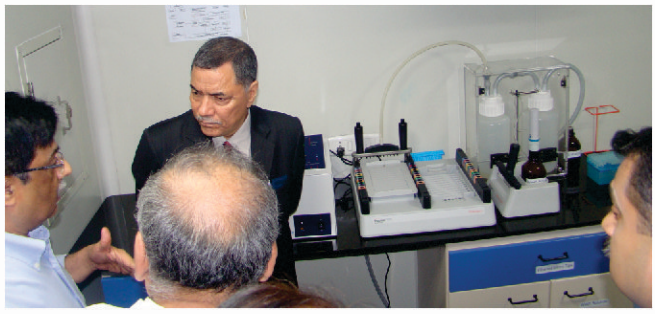
The reason, these bugs are so frightening is because they spread and mutate, so that now many of them [including CRKP] are susceptible only to [the antibiotic] **Colistin**, which is very toxic and causes kidney damage. Some have even become resistant to that, and then there are very few lines of defense. So with the mutation of the bacteria coupled with the decline in new drugs, we can see we are headed toward collision.

Dr. Neelam Sachdeva

INAUGURATION OF NAT (NUCLEIC ACID TESTING) LAB IN THE BLOOD BANK

The NAT (Nucleic Acid Testing) Lab was inaugurated by CEO, Mr. D. S. Negi on 7th November 2011. This is a great achievement for RGCI & RC as this is one of the few hospitals in the country offering this facility. Nucleic acid testing is important for increasing the safety of blood. Dr. Anurag Mehta, Director Lab Services, explained the importance of NAT testing to those present.





Nucleic Acid testing is done for detection of HIV, Hepatitis B and Hepatitis C viruses which are the most frequent transfusion transmitted infections. The window period of these infections is considerably reduced by NAT testing , providing safest possible blood to the patients. The seroprevalence of HIV in India is 0.36% of the population, that of HCV is 0.9% and HBV is 2.5-4%. The best way to avoid spread of these infections is to use methods which reduce the window period of these infections and the answer is NAT which is the most sensitive technique available presently.

Using this technique, the window period can be reduced from 70 days to 7 days for HCV, from 56 days to 20 days for HBV and from 22 days to 8 days for HIV which would considerably improve blood safety.

HAND HYGIENE WORKSHOP

A workshop on hand wash was conducted in the pediatric in-patient and day care wards of RGCI &RC by Soumya, Pooja Rani & Pooja Sharma under the guidance of Dr. Gauri Kapoor, Director Pediatric Hematology and Oncology. The target audience included pediatric patients and their parents. Children with cancer especially those on treatment for cancer have low immunity so they can catch infections very easily. This can make the child quite ill and also lead to interruption in cancer treatment. As infection may spread through the hands of family members as well as care givers like nurses & doctors hand washing is the best preventive measure.

When should you wash your hands? It is Important for all of us to know when:

- Before and after meals
- After traveling in bus or car
- After touching parts of your body that are not clean
- After using wash room
- After coughing, sneezing or using handkerchief or tissue
- After using phone or computer keyboard
- After handling pets
- Before and after cooking food
- After washing utensils or soiled clothes
- Kissing is also source of passing infection to the child

How should you wash hands?

Wash thoroughly with soap and water and dry hands completely with clean and dry towel or disposable tissues.

Posted at : Ashok Vihar Head Post Office, Delhi-110052
Registered with Registrar of Newspaper Under No. 68797/98
Postal Department Registration No. DL(N)06/004/2009-11
Licensed to Post without prepayment under No.:"U"(DN)-162/ 2009-11

Children's Day Celebration in the Pediatric Cancer Unit of Rajiv Gandhi Cancer Institute & Research Centre. Activities included painting competition, fancy dress and puppet show that were immensely enjoyed by one and all.

Editor : Dr. A. K. Dewan

To, _____

_____

_____

If undelivered please return to :
RAJIV GANDHI CANCER INSTITUTE & RESEARCH CENTRE
Sector-V, Rohini, Delhi-110085

Printed & Published by Mr. K. K. Mehta on behalf of Indraprastha Cancer Society & Research Centre and Printed at Raju Art Printers, 18-A, Old Gobind Pura Extn., Street No. 2, Parwana Road, Delhi-51, Tel. : 9871006333
Published from RGCI&RC, Sector-V, Rohini, New Delhi-110085 • Editor : Dr. A. K. DEWAN