Vancomycin resistant Enterococci : prevention and control measures for long term care facilities

Summary

The application of infection, prevention and control (ICP) measures for long term facilities must be adapted to the specific characteristics of the environment, as well to the clientele who are accommodated.

For the people living in the long-term accommodation, the facility represents a home lifestyle environment. Although the accommodation in a home lifestyle environment intuitional substitute is more and more reserved for people who present complex pathologies or important physical, sensory or cognitive disabilities, it must remain a friendly and pleasant place of residence. This reality guides interventions to achieve by the care setting. The intensity of care is usually different from that in acute care settings and the proportion of people at risk is less. The length of stay of the residents (often several years) limits, among others, long-term application of restrictive measures. It is also important to consider the impact that isolation can have on a resident.

It is in the light of these elements that the Committee on nosocomial infections of Quebec (CINQ) has issued specific recommendations for these specials environments.

The main retained orientation for ICP measures in home lifestyle environment and in long term care settings is **to prevent infections by vacomycin resistant enterococci (VRE)**. This does not mean that one should not consider transmission. On the contrary, the CINQ considers that the adequate application of routine practice (including resident's hygiene and environmental hygiene and management of excreta) is sufficient in the

theses areas to prevent transmission. This clientele is less likely to develop an infection (Crossley, 2001), the infrequent transmission (Crossley, 2001) in these settings and the long period of carrying in some studies (Brennan *et al*., 1998) were important elements to determine the retained orientation.

The recommendations formulated in this document are taken from data in the literature, clinical experience and expert opinion in the field of prevention and control of infections. They are specific to home lifestyle environment and long term care settings and often very different from those in acute care settings (CINQ, 2012).

Characteristics of vancomycin resistant enterococci

Infectious agent and reservoir	▪ Vacomycin resistant enterococci (VRE) have increased steadily since their first identifications in the 80 (Europe and US) and 90 (Canada) (CINQ, 2012). Data from provincial monitoring program (SPIN) show a similar increase in Quebec (INSPQ, 2014). ▪ These are gram-positive bacteria and have developed adaptation mechanism to survive in human digestive and genital tract (Mandell *et al.*, 2010; Agudelo Higuita & Huycke, 2014). ▪ The main reservoir for VRE in health care settings consists of stool by colonized residents. ▪ These bacteria can survive in the environment for periods of time ranging from 5 days to about 4 months, depending on environmental conditions (ASPC, 2010). ▪ The presence of colonized residents in health care settings is a reservoir and could be an opportunity for dissemination of VRE (Elizaga *& al*., 2002). ▪ *E. faecalis* and E. *faecium* are the most frequently found species (CINQ, 2012; Agudelo Higuita & Huycke, 2014) among the thirty known species. These two species are responsible for nearly 99% of transmission and outbreaks reported in Quebec.

Resistance to antibiotics	▪ All enterococci have an intrinsic resistance (registered in the chromosomes) to several antibiotics, but particularly aminoglycosides (low level) and β-lactams (CINQ, 2012).
	▪ Some enterococci have acquired resistance. Different mechanisms may be involved. The resistors can be observed to:
	  ▪ aminoglycosides (high level);
	  ▪ penicillin;
	  ▪ glycopeptides (vancomycin, teicoplanin);
	  ▪ chloramphenicol.

Mode of transmission and acquisition	▪ By direct contact from person to person (fecal-oral type). ▪ By indirect contact with the care equipment or environmental of a colonized or infected resident. ▪ These organisms are able to survive on hands, gloves and gowns of workers providing direct care (Mandell *& al.*, 2010).

Duration of colonization and risk transmission	▪ The risk of transmission lasts as long as the resident is colonized or infected. It is increased in the presence of wound discharge (colonized or infected) and fecal incontinence. ▪ The duration of colonization varies according to studies. The median duration of the carrier state is 41 to 49 days (Byers *& al*., 2002) and could persist in cancer patients for a period of over 3 years (Roghmann *& al*., 1997). ▪ Increases of VRE after taking antibiotics was observed in people whose screenings were once again negative (Byers *& al.*, 2002; Donskey *& al*., 2002).

Infections	▪ VRE infections are rare: the provincial program of nosocomial infections (SPIN) on VRE reports a nosocomial infection rate of 0.19 per 10,000 presence-days (INSPQ, 2014) for acute care environments in Quebec. The application measures of prevention and control for specific infections in these settings keeps this low rate.
	▪ VRE infections in long-term accommodation and long-term care are relatively rare (Brennen *& al.*, 1998).
	▪ Among VRE infections reported specially in long-term accommodation and long-term care include :
	  ▪ Urinary tract infections (UTI) more often (Smith *& al*., 2000);
	  ▪ Wound infections (Moro & Gagliotti, 2013).
	▪ Antibiotics are available for treatment of infections.

Epidemiology in long-term accommodation and long-term care	▪ The prevalence and incidence in long-term accommodation and long-term care is little known. ▪ The majority of colonized residents in long-term accommodation and long-term care have acquired VRE during a hospital stay. (Brennen *& al*., 1998). ▪ Available data vary, but seem however to show that the prevalence of colonization is low, between 1 and 19% according to studies (Padiglione *& al*., 2001; Stuart *& al*., 2011; van Bull *& al*., 2012). ▪ The transmission is low in long-term accommodation and long-term care (Crossley, 2001).
Increased risk factors for acquisition or infections at VRE[1]	▪ Hospitalization in acute care environment. The increase in the number of hospitalizations increases the risk of colonization and therefore infection. ▪ Intake of antibiotics. ▪ Presence of invasive devices. ▪ Wound pressure. ▪ Bedridden resident, with higher degree of disease severity.

[1] The intensity and number of lesser care in long-term accommodation and long-term care make residents less likely to acquire or develop a VRE infection, that the patients in acute care settings.

Prevention and control measures

Samples	
Screening	▪ It is not recommended to screen in long-term accommodation and long-term care in the following situations: ▪ On admission; ▪ Upon returning from a hospitalization in acute care; ▪ Routinely during the stay in long term care settings (for known carriers residents); ▪ Upon the discovery of an unknown case, colonized or infected; ▪ During release or transfer to another long-term care settings.
Infection	▪ Take samples if presence of signs and symptoms are compatible with an infection.
ACCOMODATIONS, DISPLACEMENTS OF RESIDENT, VISITORS	
Accommodation of resident	▪ A known colonized resident can share the room of a non-colonized resident if absence of factors increasing the risk of environmental contamination in the carrier (not contained faecal incontinence, wound with discharge, etc.) or acquisition by contact (wound, urinary catheter, etc.). ▪ Do not place in the same room a known VRE with a known carrier of methicillin-resistant *Staphylococcus aureus* (MRSA). ▪ A known resident colonized with VRE, which has a faecal incontinence or uncontained wound discharge should be accommodated in a single room. He should also have access to a reserved toilet.
Consultation or appointment in another areas	▪ Notify the other areas when transferring a known resident VRE to another center or another department, according to the established procedure. ▪ Indicate the date of the last known positive specimen for this resident.
Visitors	▪ There are no special measures for visitors. ▪ Encourage visitors to perform hand hygiene before and after the visit to their relatives. ▪ A visitor who gives care should apply the same measures as those recommended for caregivers' staff.
HAND HYGIENE, PERSONNAL PROTECTIVE EQUIPEMENT AND OTHER PRECAUTIONS	
Hand hygiene	▪ Soap and water or utilization of hydro-alcoholic solution.
Routine practices and additional precautions (known or unknown carrier resident)	▪ Routine practices for all, especially the use of gowns and gloves if faecal incontinence that cannot be contained by an incontinence layer or presence of a wound in which discharge cannot be contained by a dressing. ▪ The wear of the gown and gloves should be maintained as long as there is presence of faecal incontinence not contained or wound with non-content discharge. ▪ The application of additional precautions is not recommended.
Care supplies and medical equipment	▪ Limit the amount of material that enters the room.

	▪ Clean all reusable care equipment before using it for another resident, according to the routine practices. ▪ Discard the disposable medical supplies according to the center usual recommendations.
Resident's hygiene	▪ Maintain good hygiene of residents, according to the procedure of the establishment. ▪ Ensure regular change of sheets and bedding for residents according to procedures.
Management of excreta	▪ Arrange to avoid contamination excreta in the environment.
ENVIRONMENT, LANDRY, WASTW MANAGEMENT	
Environmental disinfection	▪ Use personal protective equipment usually recommended by the center. ▪ Use normal disinfectants. It is not necessary to use chlorine solutions for disinfecting the environment of a known patient colonized or infected with VRE. ▪ Carrying out disinfection according to the usual procedures of the establishment. ▪ Dispose or clean equipment use for the disinfection according to the center's usual procedures.
Dishes	▪ Apply the usual procedure of the center for cleaning dishes and utensils.
Laundry	▪ Apply the usual procedures of the center for washing the linen and bedding and clothing of the resident. ▪ Apply the usual procedures for the washing on the units/floor or by families of the resident' clothes.
Waste management	▪ Apply the usual procedures of the center for waste disposal.
OUTBREAK	
Definition of an outbreak	▪ Presence in one health facility of two new cases of colonization or infection with the same VRE strain transmitted in health care settings.
Infection prevention and control measures	▪ Strengthen implementation of routine practices. ▪ Identify factors that explain the origin of the outbreak transmission and correct them. ▪ There is no recommended screening.

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Legal Deposit – 2e quarter 2015
National Library and Archives of Quebec
Library and Archives Canada
ISBN : 978-2-550-73180-1 (PDF)

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