

Risk factors associated with antimicrobial resistant organism carriage in residents of Residential Aged Care Facilities

Christine Hunt, BNsg, Grad Dip IC

Risk, Quality & Compliance Manager, Eldercare Inc

(no disclosures or conflicts of interest)

Background 1

Residential Aged Care Facilities (RACFs)

- Provide nursing and personal care to the elderly who can no longer remain in their own home.

Residents more susceptible to infections than the elderly living in the general community, due to:

- multiple chronic diseases
- polypharmacy
- communal living,
- functional impairment



Background 2

- Antimicrobial resistant organisms found in RACFs include:
 - Methicillin Resistant Staphylococcus aureus (MRSA),
 - Vancomycin Resistant Enterococcus faecalis (VRE),
 - Multi-Resistant Gram Negative Organisms (MRGNs)
- AROs cause morbidity and mortality in residents
- Residents may act as reservoirs



Background 3

- Many Infection Control Guidelines recommend a risk-management approach in RACFs
- Risk factors are not always well defined nor supported by evidence.

Background 4

- Rigorous infection prevention strategies that are appropriate for the Acute Care setting are often inappropriate in the aged care setting
- Rigorous infection prevention strategies may
 - limit a resident's activity and engagement with the residential care community.
 - impose potentially unnecessary financial burdens on facilities.

- Identify risk factors associated with ARO's
- Risk factors may include:
 - Resident factors
 - Institutional factors
 - Environmental factors



- Systematic review process
- Setting & participants
- What was measured
- Types of Studies



- Types of Studies
 - 32 included after appraisal
 - Descriptive observational (25)
 - Analytical observational (7)
 - 11 to 9,156 participants.
 - Total of 29,957 residents
 - Various countries
 - 1986-2013
- What AROs?
 - MRSA (18)
 - VRE (2)
 - MDRGNB (7)
 - Combination (3), Other (2)
- What Risk factors?
 - Resident related (41)
 - Institution related (25)
 - Environment related (6)
 - Meta analysis of 15



Resident-associated

1. Comorbidities
 - Cerebral condition
2. Limited mobility
3. Dependency
4. Wounds
 - Decubitus ulcers
5. Urinary incontinence
6. History of ARO
7. Male

Institution-associated

1. Invasive device
 - Gastrostomy/Nasogastric
 - IDUC/CUD
2. AB use
 - Within 12 weeks
 - Fluoroquinolone/Cipro
 - Cephalosporins
3. Hospital stay

Overall	Odds Ratio	P-value	Risk Ratio	P-value
Comorbidities*	1.64	<0.01	1.43	0.04
Limited Mobility	2.20	<0.01	1.42	<0.01
Dependency	2.66	<0.01	1.90	<0.01
All Wounds*	2.35	<0.01	1.99	<0.01
Incontinence	4.05	<0.01	3.26	<0.01
History of ARO	2.70	<0.01	2.88	0.01
Male Sex	1.20	0.03	1.20	0.04
Invasive Device*	2.61	<0.01	2.13	<0.01
AB Use	2.40	<0.01	1.73	<0.01
Hospital stay	2.05	<0.01	1.73	<0.01

Sub-group	Odds Ratio	P-value	Risk Ratio	P-value
Cerebral condition	1.70	0.02	NR	NR
Wounds*	2.35	<0.01	1.96	<0.01
Decubitus ulcers*	2.90	<0.01	2.31	<0.01
Gastrostomy/NG*	2.09	<0.01	1.55	0.03
IDUC/CUD	2.95	<0.01	2.60	<0.01
ABs within 12 weeks	2.35	2.35	1.98	<0.03
AB FluoroCipro	2.03	2.03	1.66	<0.01
AB Cephalosporins	2.15	2.15	1.71	<0.01

Single studies not included in meta-analysis

Increased risk

- living area and risk of carriage of an ARO
- MRSA prevalence on admission
- Body Mass Index (BMI) less than or equal to 18.5
- Medical imaging

Lower risk

- high level MRSA control activities
- Antimicrobial soap
- More sinks

Recent publication

(Hogardt et al July 2015)

- History of MRSA
- IDUC
- Gastrostomy
- Previous ABs

- Limited studies looking at Environmental risk factors
- English only
- Comorbidity type not always specified in studies
- Sample size

- Identification, assessment and management of risks
- Development of a reliable assessment tool
- Risk identification of those residents most at risk
- Influence admission processes for new residents
- Monitoring of existing residents
- Institute IC precautions commensurate with risk

- Infections caused by AROs may be prevented by identifying residents who are at risk
- This systematic review has identified 10 significant risk factors for carriage of AROs in Residents of RACFs
- Further research would be required to develop a valid risk assessment tool

Thank You

Questions