

MRSA infected wounds in a community hospital in rural tropical Ecuador

Artículos originales

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Abstract

Introduction: Although community acquired MRSA has been well described in many areas around the globe, little information is available about the prevalence of MRSA infections in rural areas of the Andean Region of South America. This study characterizes wound infections from a rural community hospital in Ecuador.

Methods: A retrospective review of 235 bacterial isolates from infected wounds that included wound type, site, gender, etc...

Results: Ninety-two (39.1%) isolates were *Staphylococcus aureus*. Of these, forty-two (44.7%) were methicillin resistant *S. aureus* (MRSA).

Conclusion: community acquired MRSA wound infections rates appear to warrant the use of empiric antibiotics that cover MRSA infections. If wound infections reflect a bacterial epidemiology similar to that of skin and soft tissues infections, empiric anti-MRSA antibiotic coverage is also warranted. In Ecuador, national antibiotic guidelines do not provide for such empiric coverage.

Background

Staphylococcus aureus is a bacterium that causes life-threatening infections in healthcare and in the community. Historically associates with hospital settings, in 1999 an outbreak of Methicillin resistant Staph aureus (MRSA) associated with the USA300 clone in a state prison in Mississippi, USA, marked the beginning of the community acquired MRSA outbreak (CDC 2001). By

2004, MRSA became the major cause of skin and soft tissue infections (SSTI) in the United States (Talan, 2011).

The USA300 Latin American variant (USA300-LV) was first identified in 2005, disseminating through communities and hospitals in Colombia, Ecuador and Venezuela (Reyes 2009) (Arias, 2008) (Alvarez, 2006). Interestingly, it has been demonstrated that the South American epidemic is not an extension of the North American epidemic, but rather were concurrent, with the two variants showing a common ancestor (Planet, 2015). Of note, a different MRSA isolate was identified in Uruguay during a community-associated MRSA outbreak in 2003 (Ma XX, 2005).

This study reviews the bacterial epidemiology of wound infections at a rural hospital in a poor community in rural, tropical Ecuador

Methodology

Bacterial isolates and their resistance patterns from wound cultures from 2014-2017 were reviewed retrospectively with no knowledge of patient identification. *S. aureus* isolates were studied to determine rates of MRSA and their specific resistance patterns.

Results

235 bacterial isolates were reviewed from various wound sources. (tabla 1)

Tabla 1. Anatomic distribution of bacterial isolates

UBICACIÓN ANATOMICA	NUMERO DE AISLAMIENTOS	PORCENTAJE %
PIES	56	23.8
PIERNAS	55	23.4
MANOS	20	8.5
QUIRURGICA ABDOMINAL	18	7.7
NO ESPECIFICA	14	6.0
CABEZA	13	5.5
GLUTEO	10	4.3
SURCO BALANO PREPUCIAL	9	3.8
BRAZO	5	2.1
ESPALDA	5	2.1
PELVIS	5	2.1
TORAX	5	2.1
AXILA	4	1.7
QUEMADURA	4	1.7
PERIANAL	3	1.3
ESCROTO	2	0.9
MAMA	2	0.9
QUIRUGICA EXTREMIDADES	2	0.9
CUELLO	1	0.4
GLANDULA BARTOLINO	1	0.4
PERIODONTAL	1	0.4
TOTAL	235	100.0

92 of these isolates were *S. aureus*. (table 2) 42 were identified as MRSA with their respective resistance patterns. (table 3)

Tabla 2. Resultados de pruebas de sensibilidad en *S. aureus* en heridas

ANTIBIOTICO	CONCENTRACION (mg/dL)	AISLADOS SENSIBLES	AISLADOS INTERMEDIOS	AISLADOS RESISTENTES	PORCENTAJE DE RESISTENCIA %
AMPICILINA	10	11	0	83	88.3
OXACILINA	1	52	0	42	44.7
CEFOXITIN	30	52	0	42	44.7
ERITROMICINA	15	68	1	25	26.6
AZITROMICINA	15	68	1	25	26.6
TRIMETOPRIM-SULFAMETOXAZOL	25	70	1	23	24.5
DOXICICLINA	30	77	0	17	18.1
CLINDAMICINA	2	79	0	15	16.0
CIPROFLOXACINA	5	87	0	7	7.4
LEVOFLOXACINA	5	87	0	7	7.4
RIFAMPICINA	5	91	0	3	3.2
GENTAMICINA	10	91	1	2	2.1
NETILMICINA	30	91	1	2	2.1
LINEZOLID	30	94	0	0	0.0
VANCOMICINA	30	94	0	0	0.0
	TOTAL	1112	5	293	20.8

Tabla 3. Patron de resistencia de 42 aislamientos de MRSA de heridas

MRSA RESISTENCIA ANTIBIOTICO	42 AISLAMIENTOS	
	NUMERO DE CASOS	PORCENTAJE ENCONTRADO
AMPICILINA	42	100.0
TRIMETOPRIM-SULFAMETOXAZOL	21	50.0
DOXICICLINA	17	40.5
AZITROMICINA	13	31.0
ERITROMICINA	13	31.0
CLINDAMICINA	7	16.7
CIPROFLOXACINA	5	11.9
GENTAMICINA	2	4.8
VANCOMICINA	0	0.0
LINEZOLID	0	0.0

Discussion

These results reveal that MRSA is an important pathogen responsible for wound infections in this rural community. Further studies are required to determine how this pathogen has become widely disseminated in this area. This resistant bacteria requires attention when discussing

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treatment options, as the usual antibiotics used for wound infections of the skin include first generation cephalosporins and antistaphylococcal penicillins such as dicloxacillin. In this region of Ecuador, anecdotally, amoxicillin is also used considerably. Most wound infections are not cultured, so informed empiric therapeutic decisions are critical.

In other areas of the world, such as the USA, there is significant sensibility to TMP-Sulfa and to Doxycycline, however this small report suggests that with a 50% and 40% resistance rate respectively, these antibiotics might not be appropriate. Conversely, inducible Clindamycin resistance in other parts of the world is growing, but this study shows a smaller percentage of MRSA resistance to Clindamycin than to TMP-Sulfa and Doxycycline.

Ecuador's National Health Council's (CONASA) National Table of Basic Medications and National Therapeutic Registry (Cuadro Nacional de Medicamentos Basicos), ninth revision, 2014, does not expressly recommend the use of certain oral antibiotics, known to be more effective against MRSA skin and soft tissue infections (Cuadro Nacional de Medicamentos Basicos, 2014). This study would suggest that these recommendations might require updating.

Conclusion

MRSA is an important causes of wound infections in a small rural tropical community in Ecuador. Further studies are required to determine the role of this concerning bacteria in skin and wound infections, and to determine what antibiotics demonstrate utility against MRSA in this community. Current ministry of public health recommendations for treating skin and soft tissue infections might require updating to take into account this worrisome bacteria.

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