UK Health Security Agency

The effectiveness of decolonisation regimes in individuals infected with or exposed to Panton-Valentine leukocidin-positive *Staphylococcus aureus* (PVL-SA) skin and soft tissue infection

A rapid systematic review

Contents

Main messages

1. This rapid systematic review (search up to 30 January 2024) identified and assessed the available evidence to determine whether decolonisation was effective to prevent recurring and secondary infections of Panton-Valentine Leukocidin-positive *Staphylococcus aureus* skin and soft tissue infection, and if so, the most effective decolonisation regime.

2. In total, 2,779 records from 5 databases and registers were screened. No studies were identified for inclusion in this review.

3. In summary, no published randomised or non-randomised controlled trials were identified to determine the effectiveness of decolonisation strategies for individuals either infected with or exposed to Panton-Valentine Leukocidin-positive *Staphylococcus aureus* skin and soft tissue infection and therefore cannot inform whether decolonisation is effective.

Purpose

The purpose of this rapid systematic review was to identify and assess the available evidence for strategies to decolonise individuals either infected with or exposed to Panton-Valentine Leukocidin-positive *Staphylococcus aureus* (PVL-SA) skin and soft tissue infections. For this review, decolonisation refers to the process by which PVL-SA is reduced or eradicated to reduce the rate or likelihood of infection.

There were 2 research questions:

1. Is decolonisation an effective method for preventing recurring infections and secondary infections in close contacts for individuals affected by PVL-SA skin and soft tissue infection?
2. If so, what is the most effective decolonisation regime for preventing recurring infections and secondary infections in close contacts?

Methods

A rapid systematic review was conducted following streamlined systematic methods to accelerate the review process (1). A literature search was completed to look for relevant interventional studies (randomised controlled trials, non-randomised controlled trials) published or available as preprint up to 30 January 2024. The reference lists of relevant systematic reviews were checked to identify any additional primary studies.

A protocol including the review question, the eligibility criteria, and all other methods was produced before the literature search was conducted. Full details of the methodology are provided in the protocol in Annexe A.

There were several deviations from the study protocol, which are outlined along with justifications in Annexe A. Deviations included:

- hospitals and healthcare settings were changed from being considered as excluded to included settings, as the interventions listed in the protocol for decolonisation of individuals may be used in hospital or healthcare settings as well as community settings
- hypochlorous acid was added to the list of included interventions as it was highlighted as an antisepsis agent that may be beneficial for decontamination of settings contaminated with PVL-SA

These deviations required a change to the search strategy. As these changes were made after the initial searches, and screening had been completed, the searches were re-run and screening was redone following the protocol deviations. Results from the previous search and screening were not shared with the review commissioners.

Screening of title and abstracts was completed in duplicate by 2 reviewers for 20% of the eligible studies, with the remainder completed by one reviewer. Screening of full text was completed by one reviewer and checked by a second. Studies excluded at full text screening are available with the reasons why in Annexe C.

Evidence

In total, 2,779 studies were screened at title and abstract, with 70 studies identified for full text screening. There were 16 additional studies identified from studies screened at full text, and so in total 86 studies were screened at full text. No studies screened at full text were eligible for inclusion in this review. Annexe C lists these studies and their reasons for exclusion. The main reasons were due to being the wrong study type (n=46), used the wrong intervention (n=19), or assessed the wrong population (n=11) for this review protocol. No relevant systematic reviews for citation searching were identified.

Health inequalities

Community settings in which people were considered more likely to experience health inequalities, including closed accommodation settings such as prisons and group accommodation settings, were explicitly defined within the inclusion criteria in the review protocol and the search strategy included equity-focused databases. However, no studies were identified for inclusion in this review, so health inequalities could not be assessed.

Limitations

This rapid evidence review used streamlined systematic methods to accelerate the review process. Sources of evidence searched included databases of peer-reviewed and preprint research, but it is possible relevant evidence may have been missed. This review was limited to evidence from interventional studies (randomised controlled trials, non-randomised controlled trials), as these would be the best study designs to answer the research question. However, evidence from other studies (such as single arm studies) or other settings (for example, laboratory studies) may exist and provide relevant information in the absence of controlled trial evidence. One systematic review, by Lynch and others, was identified during screening that presents evidence from observational studies on the effectiveness of decolonisation strategies for PVL-SA (2), however there were no studies relevant for inclusion in this review due to different inclusion and exclusion criteria.

Conclusion

The aim of this review was to identify and assess available evidence from interventional studies that evaluated the effectiveness of decolonisation strategies in individuals either infected with or exposed to PVL-SA skin and soft tissue infection.

No relevant evidence was identified for inclusion in this review. Evidence from other studies (such as single arm studies) or other settings (for example laboratory studies) may provide relevant information in the absence of controlled trial evidence to help answer the review question.

Acknowledgment

We would like to thank colleagues within the All Hazards Public Health Response function who either reviewed or input into aspects of the review.

Disclaimer

UKHSA's rapid systematic reviews and evidence summaries aim to provide the best available evidence to decision makers in a timely and accessible way, based on published peer-reviewed scientific papers, and papers on preprint servers. Please note that the reviews:

- use accelerated methods and may not be representative of the whole body of evidence publicly available
- have undergone an internal independent peer review but not an external peer review
- are only valid as of the date stated on the review

In the event that this evidence summary is shared externally, please note additionally, to the greatest extent possible under any applicable law, that UKHSA accepts no liability for any claim, loss or damage arising out of, or connected with the use of, this review by the recipient or any third party including that arising or resulting from any reliance placed on, or any conclusions drawn from, the review.

References

1. Organisation WH. 'Rapid reviews to strengthen health policy and systems: a practical guide' 2017
2. Lynch L and others. 'Is decolonization to prevent Panton-Valentine leukocidin-positive *Staphylococcus aureus* infection in the population effective? A systematic review' Journal of Hospital Infection 2022: volume 121, pages 91 to 104
3. Academy of Nutrition and Dietetics. 'Evidence analysis manual: steps in the academy evidence analysis process' 2016

Annexe A. Protocol

There are 2 review questions:

1. Is decolonisation an effective method for preventing recurring infections and secondary infections in close contacts for individuals affected by Panton-Valentine Leukocidin-positive *Staphylococcus aureus* (PVL-SA) skin and soft tissue infection?
2. If so, what is the most effective decolonisation regime for preventing recurring infections and secondary infections in close contacts?

A search for primary evidence to answer these review questions will be conducted up to 30 January 2024.

Eligibility criteria

Table A.1 Inclusion and exclusion criteria

	Included	Excluded
Population	• adults (>18 years), children (<18 years) or neonates (0 to 4 weeks of age) who have laboratory confirmed infection with Panton-Valentine Leukocidin-positive *Staphylococcus aureus* (PVL-SA) • adults (>18 years), children (<18 years) or neonates (0 to 4 weeks of age) with confirmed contact with those diagnosed with laboratory confirmed infection with PVL-SA	• non-human studies • any other skin or soft tissue infection
Settings	• household and shared spaces (for example, university accommodation) • community settings (for example, sports clubs) • educational settings (for example, schools or nurseries) • group accommodation settings (for example, homeless accommodations, adult social care settings)	• laboratory settings

	Included	**Excluded**
	• other closed accommodation settings (for example, prisons, military bases) • hospitals • healthcare settings (for example, nursing homes)	
Context	All contexts	
Intervention or exposure	For question one, treatment with the following decolonisation regimes compared to each other or with no decolonisation: • Prontoderm • Octenisan • Chlorhexidine • Mupirocin • Clindamycin • Rifampicin • Linezolid • Naseptin • Flucloxacillin • Tetracycline (including doxycycline and minocycline) • Trimethoprim • Hypochlorous acid For question 2, treatment with any of the following decolonisation regimes compared to each other: • Prontoderm • Octenisan • Chlorhexidine • Mupirocin • Clindamycin • Rifampicin • Linezolid • Naseptin	Any other treatment of PVL-SA

	Included	Excluded
	• Flucloxacillin • Tetracycline (including doxycycline and minocycline) • Trimethoprim • Hypochlorous acid	
Outcomes	• laboratory-confirmed re-infection with PVL-SA • laboratory-confirmed infection with PVL-SA after coming into contact with an infected person	
Language	English	Non-English language studies
Date of publication	Up to 30 January 2024	
Study design	Interventional studies (randomised controlled trials, non-randomised controlled trials)	• systematic or narrative reviews • modelling studies • laboratory studies • cohort studies • case-control studies • case studies • case reports • single-arm trials
Publication type	• published (peer-reviewed) • pre-print	• guidelines • opinion pieces • letters

Identification of studies

We will search OVID Medline, OVID Embase, Cochrane Central, Web of Science Core Collection and Web of Science Preprint Citation Index for studies published before 30 January 2024. The search strategy will be checked by another information specialist.

Additional studies may be identified through other methods such as grey literature searching or through consultation with topic experts within UKHSA.

Screening

Screening on title and abstract will be undertaken in duplicate by 2 reviewers for at least 20% of the eligible studies, with the remainder completed by one reviewer. Disagreement will be resolved by discussion.

Screening on full text will be undertaken by one reviewer and checked by a second.

Data extraction

Summary information for each study will be extracted and reported in tabular form. Information will include study date, decontamination method used, results, and any relevant contextual data. This will be undertaken by one reviewer and checked by a second.

Risk of bias assessment

We will perform risk of bias assessment at the primary study level using the Quality Criteria Checklist (QCC) (3). Risk of bias will be assessed by 2 reviewers independently with disagreements resolved through discussion or with a third reviewer.

Synthesis

If data is presented in a consistent format between studies, a narrative synthesis will be produced to describe the results from this review. Alternatively, if data is too heterogeneous, a narrative summary of results per study will be provided. Variations between decontamination methods will be synthesised and described if possible.

Search strategy

Database: Ovid MEDLINE(R) ALL <1946 to January 30, 2024>

1. exp Staphylococcus aureus/ (91051)
2. exp Staphylococcal Infections/ (72623)
3. S* aureus.tw,kf. (140419)
4. MRSA.tw,kf. (30002)
5. MSSA.tw,kf. (4398)
6. staphylococc*.tw,kf. (182762)
7. or/1-6 (223336)
8. Leukocidins/ (1728)
9. leukocidin*.tw,kf. (2199)
10. leucocidin*.tw,kf. (536)

11. PVL.tw,kf. (4944)
12. LukS.tw,kf. (364)
13. LukF.tw,kf. (319)
14. Luk pv.tw,kf. (48)
15. or/8-14 (6449)
16. 7 and 15 (3342)
17. (decoloni* or de-coloni*).tw,kf. (2662)
18. (re-coloni* or recoloni*).tw,kf. (3026)
19. (coloni#e* or coloni#ation or coloni#ing or colony or colonies).tw,kf. (298594)
20. Carrier State/ (22537)
21. carrier*.tw,kf. (264831)
22. carriage.tw,kf. (18382)
23. clearance.tw,kf. (190940)
24. exp Infection Control/ (71288)
25. exp Communicable Diseases/pc (92614)
26. prevention control.fs. (1477433)
27. (infect* adj3 (prevent* or control*)).tw,kf. (123324)
28. (disease* adj3 (prevent* or control*)).tw,kf. (204794)
29. (bacteri* adj3 (prevent* or control*)).tw,kf. (17842)
30. (spread* adj3 (prevent* or control*)).tw,kf. (18477)
31. (prevent* adj3 transmi*).tw,kf. (17578)
32. body surface*.tw,kf. (26726)
33. skin.tw,kf. (654413)
34. exp Skin/ (249098)
35. (nose or nasal*).tw,kf. (177464)
36. respiratory.tw,kf. (587723)
37. exp Respiratory System/ (545148)
38. (gastrointestinal* or gastro-intestinal*).tw,kf. (315004)
39. exp Gastrointestinal Tract/ (698595)
40. exp Nose/ (100580)
41. or/17-40 (5000742)
42. exp Anti-Infective Agents/ (1846399)
43. Octenisan.tw,kf. (3)
44. Chlorhexidine*.tw,kf. (13231)
45. mupirocin.tw,kf. (2132)
46. clindamycin.tw,kf. (12567)
47. rifampicin.tw,kf. (19755)
48. rifampin.tw,kf. (9419)
49. linezolid.tw,kf. (7890)
50. naseptin.tw,kf. (16)
51. chloramphenicol.tw,kf. (31501)
52. erythromycin.tw,kf. (23950)
53. fluoroquinolone.tw,kf. (11109)

54. levofloxacin.tw,kf. (10228)
55. methicillin.tw,kf. (41998)
56. minocycline.tw,kf. (8196)
57. mupirocin.tw,kf. (2132)
58. oxacillin.tw,kf. (5458)
59. penicillin.tw,kf. (59278)
60. tetracycline.tw,kf. (41714)
61. doxycycline.tw,kf. (17086)
62. trimethoprim.tw,kf. (20256)
63. fusidic acid*.tw,kf. (2076)
64. retapamulin.tw,kf. (139)
65. Bacitracin.tw,kf. (3831)
66. povidone iodine.tw,kf. (3974)
67. triclosan.tw,kf. (4375)
68. prontoderm.tw,kf. (5)
69. (flucloxacillin or floxacillin).tw,kf. (1058)
70. (anti microb* or antimicrob*).tw,kf. (242854)
71. (anti infective* or antiinfective*).tw,kf. (7861)
72. (anti bacterial* or antibacterial*).tw,kf. (118272)
73. (antiseptic* or anti septic*).tw,kf. (11342)
74. (antibiotic* or anti biotic*).tw,kf. (440432)
75. Hypochlorous Acid/ (3022)
76. (hypochlorite or hypochlorous acid*).tw,kf. (12397)
77. (chloric* acid or chloranol or hydroxidochlorine).tw,kf. (51)
78. (hypochlorite or Chlorine hydroxide or Hypochloric acid or Chlorooxidane).tw,kf. (9858)
79. or/42-78 (2203534)
80. 16 and 41 and 79 (1439)

Database: Embase <1974 to 2024 January 30>

1. exp Staphylococcus aureus/ (220225)
2. exp Staphylococcus aureus infection/ (18272)
3. S* aureus.tw,kf. (177350)
4. MRSA.tw,kf. (43354)
5. MSSA.tw,kf. (7235)
6. staphylococc*.tw,kf. (212788)
7. or/1-6 (307381)
8. Panton Valentine leukocidin/ (2687)
9. leukocidin.tw,kf. (2570)
10. leucocidin*.tw,kf. (618)
11. PVL.tw,kf. (7534)
12. LukS.tw,kf. (473)
13. LukF.tw,kf. (399)

14. Luk pv.tw,kf. (54)
15. or/8-14 (9362)
16. 7 and 15 (4416)
17. (de-coloni* or decoloni*).tw,kf. (3209)
18. (recoloni* or re-coloni*).tw,kf. (3174)
19. (coloni#e* or coloni#ation or coloni#ing or colony or colonies).tw,kf. (353355)
20. disease carrier/ or asymptomatic carrier/ (34583)
21. carrier*.tw,kf. (317752)
22. carriage.tw,kf. (22953)
23. clearance.tw,kf. (266159)
24. skin decontamination/ (1964)
25. exp bacterial colonization/ (64298)
26. infection control/ (102077)
27. communicable disease control/ (5155)
28. (infect* adj3 (prevent* or control*)).tw,kf. (154970)
29. (disease* adj3 (prevent* or control*)).tw,kf. (274720)
30. (bacteri* adj3 (prevent* or control*)).tw,kf. (20593)
31. (spread* adj3 (prevent* or control*)).tw,kf. (20699)
32. (prevent* adj3 transmi*).tw,kf. (21003)
33. body surface*.tw,kf. (40501)
34. skin.tw,kf. (875231)
35. exp skin/ (431892)
36. (nose or nasal*).tw,kf. (228343)
37. exp respiratory system/ (865776)
38. exp gastrointestinal tract/ (79423)
39. (gastrointestinal* or gastro-intestinal*).tw,kf. (445751)
40. exp nose/ (78950)
41. or/17-40 (3836243)
42. exp *antiinfective agent/ (1825084)
43. Octenisan.tw,kf. (25)
44. Chlorhexidine*.tw,kf. (15794)
45. mupirocin.tw,kf. (3111)
46. clindamycin.tw,kf. (17194)
47. rifampicin.tw,kf. (25308)
48. rifampin.tw,kf. (12538)
49. linezolid.tw,kf. (11790)
50. naseptin.tw,kf. (61)
51. chloramphenicol.tw,kf. (27896)
52. erythromycin.tw,kf. (27541)
53. fluoroquinolone.tw,kf. (14669)
54. levofloxacin.tw,kf. (16601)
55. methicillin.tw,kf. (53120)
56. minocycline.tw,kf. (11133)

57. oxacillin.tw,kf. (6798)
58. penicillin.tw,kf. (53631)
59. tetracycline.tw,kf. (44176)
60. doxycycline.tw,kf. (25707)
61. trimethoprim.tw,kf. (25619)
62. fusidic acid*.tw,kf. (2492)
63. retapamulin.tw,kf. (194)
64. Bacitracin.tw,kf. (3716)
65. povidone iodine.tw,kf. (5040)
66. triclosan.tw,kf. (4862)
67. prontoderm.tw,kf. (11)
68. (flucloxacillin or floxacillin).tw,kf. (1787)
69. (anti microb* or antimicrob*).tw,kf. (312752)
70. (anti infective* or antiinfective*).tw,kf. (10639)
71. (anti bacterial* or antibacterial*).tw,kf. (149699)
72. (antiseptic* or anti septic*).tw,kf. (12326)
73. (antibiotic* or anti biotic*).tw,kf. (572606)
74. hypochlorous acid/ (3891)
75. (hypochlorite or hypochlorous acid*).tw,kf. (13219)
76. (chloric* acid or chloranol or hydroxidochlorine).tw,kf. (50)
77. (hypochlorite or Chlorine hydroxide or Hypochloric acid or Chlorooxidane).tw,kf. (10199)
78. or/42-77 (2471842)
79. 16 and 41 and 78 (1920)

Cochrane Central Register of Randomised Controlled Trials

Date Run: 31 January 2024

No	Search	Hits
#1	MeSH descriptor: [Staphylococcus aureus] explode all trees	1172
#2	MeSH descriptor: [Staphylococcal Infections] explode all trees	1454
#3	(S* aureus):ti,ab,kw (Word variations have been searched)	4301
#4	(MRSA):ti,ab,kw (Word variations have been searched)	1111
#5	(MSSA):ti,ab,kw (Word variations have been searched)	146
#6	(staphylococc*):ti,ab,kw (Word variations have been searched)	6009
#7	#1 OR #2 OR #3 OR #4 OR #5 OR #6	6546
#8	MeSH descriptor: [Leukocidins] explode all trees	8
#9	(leukocidin*):ti,ab,kw (Word variations have been searched)	20
#10	(leucocidin*):ti,ab,kw (Word variations have been searched)	3

No	Search	Hits
#11	(PVL):ti,ab,kw (Word variations have been searched)	359
#12	(LukS):ti,ab,kw (Word variations have been searched)	11
#13	(LukF):ti,ab,kw (Word variations have been searched)	0
#14	(Luk pv):ti,ab,kw (Word variations have been searched)	2
#15	#8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14	381
#16	#7 AND #15	27
#17	((decoloni* OR de-coloni*)):ti,ab,kw (Word variations have been searched)	408
#18	((re-coloni* OR recoloni*)):ti,ab,kw (Word variations have been searched)	208
#19	((coloni#e* or coloni#ation or coloni#ing OR colony OR colonies)):ti,ab,kw (Word variations have been searched)	9905
#20	MeSH descriptor: [Carrier State] explode all trees	520
#21	carrier*:ti,ab,kw	7165
#22	carriage:ti,ab,kw	1444
#23	clearance:ti,ab,kw	29903
#24	MeSH descriptor: [Infection Control] explode all trees	1660
#25	MeSH descriptor: [Communicable Diseases] explode all trees	28884
#26	(infect* NEAR/3 (prevent* or control*)):ti,ab,kw	24298
#27	(disease* NEAR/3 (prevent* or control*)):ti,ab,kw	89770
#28	(bacteri* NEAR/3 (prevent* or control*)):ti,ab,kw	3392
#29	(spread* NEAR/3 (prevent* or control*)):ti,ab,kw	436
#30	(prevent* NEAR/3 transmi*):ti,ab,kw	3117
#31	(body NEXT surface*):ti,ab,kw	5098
#32	skin:ti,ab,kw	72463
#33	MeSH descriptor: [Skin] explode all trees	6327
#34	(nose or nasal*):ti,ab,kw	28483
#35	(respiratory):ti,ab,kw	85569
#36	MeSH descriptor: [Respiratory System] explode all trees	12907
#37	(gastrointestinal* OR gastro-intestinal*):ti,ab,kw	52810
#38	MeSH descriptor: [Gastrointestinal Tract] explode all trees	15682
#39	MeSH descriptor: [Nose] explode all trees	3335
#40		2100090
#41	MeSH descriptor: [Anti-Infective Agents] explode all trees	37165
#42	(Octenisan):ti,ab,kw (Word variations have been searched)	3

No	Search	Hits
#43	(Chlorhexidine*):ti,ab,kw (Word variations have been searched)	6038
#44	(mupirocin):ti,ab,kw (Word variations have been searched)	534
#45	(clindamycin):ti,ab,kw (Word variations have been searched)	2049
#46	(rifampicin):ti,ab,kw (Word variations have been searched)	1928
#47	(rifampin):ti,ab,kw (Word variations have been searched)	1831
#48	(linezolid):ti,ab,kw (Word variations have been searched)	631
#49	(naseptin):ti,ab,kw (Word variations have been searched)	7
#50	(chloramphenicol):ti,ab,kw	647
#51	(erythromycin):ti,ab,kw	2130
#52	(fluoroquinolone):ti,ab,kw	710
#53	(levofloxacin):ti,ab,kw	1846
#54	(methicillin):ti,ab,kw	1610
#55	(oxacillin):ti,ab,kw	165
#56	(penicillin):ti,ab,kw	2869
#57	(tetracycline):ti,ab,kw	2225
#58	(doxycycline):ti,ab,kw	2480
#59	(minocycline):ti,ab,kw	1280
#60	(trimethoprim):ti,ab,kw	2175
#61	(fusidic acid*):ti,ab,kw	250
#62	(retapamulin):ti,ab,kw	35
#63	(Bacitracin):ti,ab,kw	269
#64	(povidone iodine):ti,ab,kw	1878
#65	(triclosan):ti,ab,kw	745
#66	(prontoderm):ti,ab,kw	4
#67	(flucloxacillin or floxacillin):ti,ab,kw	235
#68	(anti microb* or antimicrob*):ti,ab,kw	17099
#69	(anti infective* or antiinfective*):ti,ab,kw	7222
#70	(anti bacterial* or antibacterial*):ti,ab,kw	20311
#71	(antiseptic* or anti septic*):ti,ab,kw	2718
#72	(antibiotic* or anti biotic*):ti,ab,kw	37591
#73	MeSH descriptor: [Hypochlorous Acid] explode all trees	619
#74	(hypochlorite or hypochlorous acid*):ti,ab,kw	1202

No	Search	Hits
#75	(chloric* acid or chloranol or hydroxidochlorine):ti,ab,kw	3
#76	(hypochlorite or Chlorine hydroxide or Hypochloric acid or Chlorooxidane):ti,ab,kw	1143
#77		1288753
#78	#16 AND #40 AND #77	23

Web of Science Core Collection (Editions: Science Citation Index 1970 – current)

Date of search: 31 January 2024

TS=("S* aureus") OR TS=(MRSA) OR TS=(MSSA) OR TS=(staphylococc*)

And:

TS=(leukocidin*) OR TS=(leucocidin*) OR TS=(PVL) OR TS=(LukS) OR TS=(LukF) OR TS=("Luk pv")

And:

(TS=(decoloni* OR “de-coloni*”) OR TS=(“re-coloni*” OR recoloni*) OR TS=((coloni?e* or coloni?ation or coloni?ing OR colony OR colonies)) OR TS=(carrier* OR carriage OR clearance) OR TS=(prevent* NEAR/3 transmi*) OR TS=((infect* NEAR/2 (prevent* or control*))) OR TS=(“body surface*” OR skin OR nose OR nasal* OR respiratory OR “gastro intestinal*” OR gastrointestinal*) OR TS=((disease* NEAR/2 (prevent* or control*))) OR TS=((bacteri* NEAR/2 (prevent* or control*))) OR TS=((spread* NEAR/2 (prevent* or control*))))

And

TS=(flucloxacillin OR floxacillin) OR TS=(Prontoderm) OR TS=(Octenisan) OR TS=(Chlorhexidine*) OR TS=(mupirocin) OR TS=(clindamycin) OR TS=(rifampicin) OR TS=(rifampin) OR TS=(linezolid) OR TS=(naseptin) OR TS=(chloramphenicol) OR TS=(erythromycin) OR TS=(fluoroquinolone) OR TS=(levofloxacin) OR TS=(methicillin) OR TS=(minocycline) OR TS=(oxacillin) OR TS=(penicillin) OR TS=(tetracycline OR doxycycline) OR TS=(trimethoprim) OR TS=("fusidic acid*") OR TS=(retapamulin) OR TS=(Bacitracin) OR TS=("povidone iodine") OR TS=(triclosan) OR TS=(("anti microb*" or antimicrob*)) OR TS=(("anti infective*" or antiinfective*)) OR TS=(("anti bacterial*" or antibacterial*)) OR TS=((antiseptic* or "anti septic*")) OR TS=((antibiotic* or "anti biotic*")) OR TS=(hypochlorite or “hypochlorous acid*” OR “chloric* acid” or chloranol or hydroxidochlorine OR hypochlorite or “Chlorine hydroxide” or “Hypochloric acid” or Chlorooxidane)

1,903 results

Protocol deviations

25 January 2024

Hospitals and healthcare settings were removed from excluded settings and added to included settings. This was done as decolonisation of individuals (adults, children, and neonates) may be done in hospital settings with the included interventions.

Hypochlorous acid (an antisepsis agent) has been added to included interventions or exposures. This intervention has been added as it is another potentially beneficial intervention for decolonisation of individuals with PVL-SA.

“Hypochlorous acid” and associated terms (hypochlorite, hypochlorous acid*, chloric* acid, chloranol, hydroxidochlorine, hypochlorite, Chlorine hydroxide, Hypochloric acid, Chlorooxidane) added to search strategy. This was to include “Hypochlorous acid” as an intervention for decontamination of settings contaminated with PVL-SA.

Search strategy date has been updated to 30 January 2024 from 15 November 2023 as searches were updated and re-run to include terms related to Hypochlorous acid.

Web of Science Preprint Citation Index

Date of search: 31 January 2024

TS=("S* aureus") OR TS=(MRSA) OR TS=(MSSA) OR TS=(staphylococc*)

And:

TS=(leukocidin*) OR TS=(leucocidin*) OR TS=(PVL) OR TS=(LukS) OR TS=(LukF) OR TS=("Luk pv")

And:

(TS=(decoloni* OR “de-coloni*”) OR TS=(“re-coloni*” OR recoloni*) OR TS=((coloni?e* or coloni?ation or coloni?ing OR colony OR colonies)) OR TS=(carrier* OR carriage OR clearance) OR TS=(prevent* NEAR/3 transmi*) OR TS=((infect* NEAR/2 (prevent* or control*))) OR TS=(“body surface*” OR skin OR nose OR nasal* OR respiratory OR “gastro intestinal*” OR gastrointestinal*) OR TS=((disease* NEAR/2 (prevent* or control*))) OR TS=((bacteri* NEAR/2 (prevent* or control*))) OR TS=((spread* NEAR/2 (prevent* or control*))))

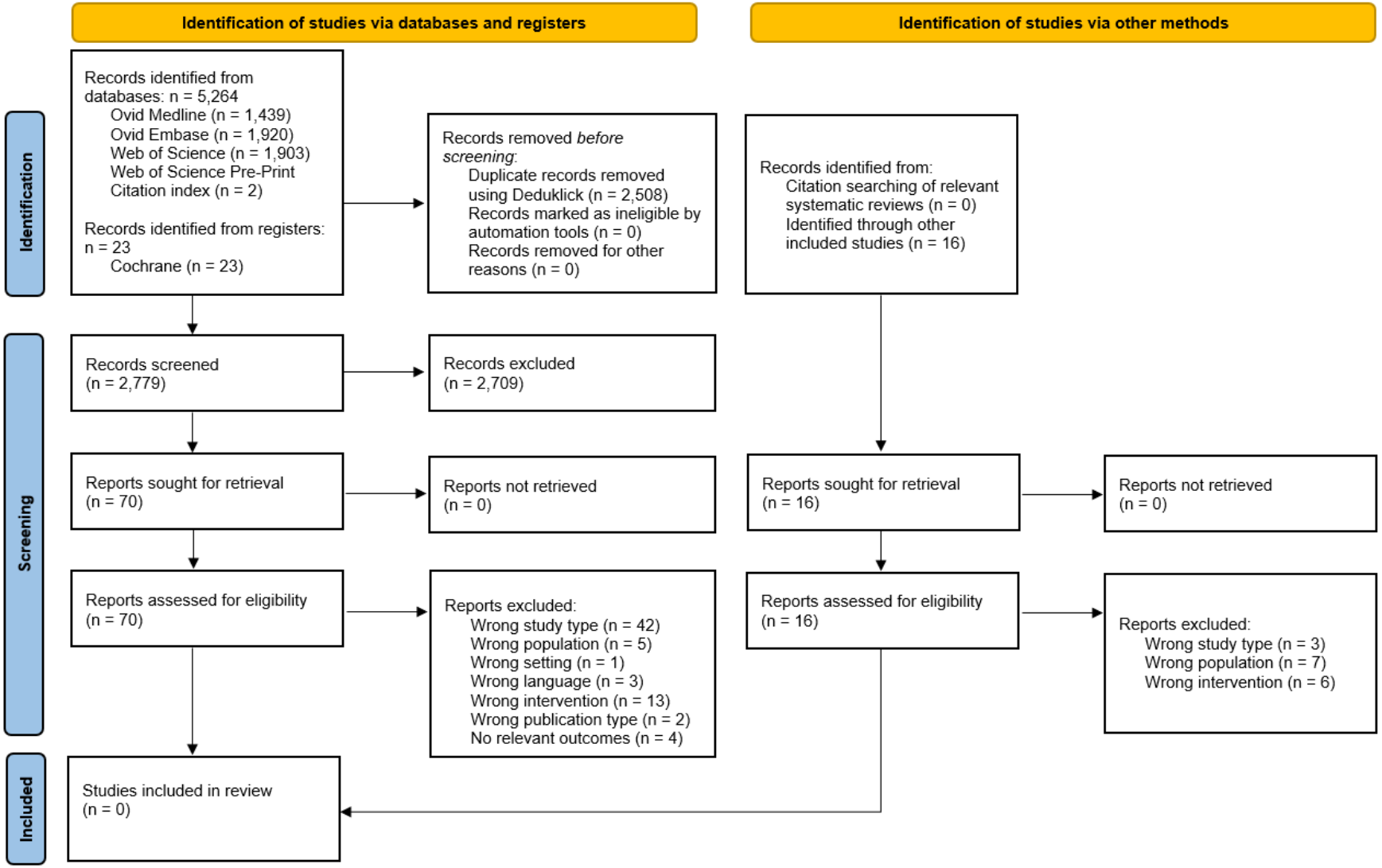
And:

TS=(flucloxacillin OR floxacillin) OR TS=(Prontoderm) OR TS=(Octenisan) OR TS=(Chlorhexidine*) OR TS=(mupirocin) OR TS=(clindamycin) OR TS=(rifampicin) OR TS=(rifampin) OR TS=(linezolid) OR TS=(naseptin) OR TS=(chloramphenicol) OR TS=(erythromycin) OR TS=(fluoroquinolone) OR TS=(levofloxacin) OR TS=(methicillin) OR TS=(minocycline) OR TS=(oxacillin) OR TS=(penicillin) OR TS=(tetracycline OR doxycycline) OR TS=(trimethoprim) OR TS=("fusidic acid*") OR TS=(retapamulin) OR TS=(Bacitracin) OR TS=("povidone iodine") OR TS=(triclosan) OR TS=(("anti microb*" or antimicrob*)) OR TS=(("anti infective*" or antiinfective*)) OR TS=(("anti bacterial*" or antibacterial*)) OR TS=((antiseptic* or "anti septic*")) OR TS=((antibiotic* or "anti biotic*")) OR TS=(hypochlorite or “hypochlorous acid*” OR “chloric* acid” or chloranol or hydroxidochlorine OR hypochlorite or “Chlorine hydroxide” or “Hypochloric acid” or Chlorooxidane)

2 results

Annexe B. Study selection flowchart

Figure B.1. PRISMA diagram



Text version of Figure B.1. PRISMA diagram

A PRISMA diagram showing the flow of studies through this review, ultimately including 0 studies.

From identification of studies via databases and registers, n=5,264 records identified from databases:

- Ovid Medline (n=1,439)
- Ovid Embase (n=1,920)
- Web of Science (n=1,903)
- Web of Science preprints (n=2)

From identification of studies via databases and registers, n=23 records identified from registers:

- Cochrane CENTRAL (n=23)

From these, records removed before screening:

- duplicate records removed using Deduklick (n=2,508)
- duplicate records removed manually (n=0)
- records marked as ineligible by automation tools (n=0)
- records removed for other reasons (n=0)

n=2,779 records screened, of which n=2,709 were excluded, leaving n=70 papers sought for retrieval, of which n=0 were not retrieved.

Sixteen studies were identified from identification of studies via other methods: n=0 studies were identified from expert consultation.

Of the n=86 papers assessed for eligibility, n=86 reports were excluded:

- wrong study type (n = 45)
- wrong population (n = 12)
- wrong setting (n = 1)
- not English language (n = 3)
- wrong intervention (n = 19)
- wrong publication type (n = 2)
- no relevant outcomes (n = 4)

n=0 papers included in the review

Annexe C. Excluded full texts

Wrong intervention (19 studies)

Bartels MD and others. 'Rise and subsequent decline of community-associated methicillin resistant *Staphylococcus aureus* ST30-IVc in Copenhagen, Denmark through an effective search and destroy policy' Clinical Microbiology and Infection 2010: volume 16, issue 1, pages 78 to 83

Chen AE and others. 'Randomized controlled trial of cephalexin versus clindamycin for uncomplicated pediatric skin infections' Pediatrics 2011: volume 127, issue 3, pages e573 to 580

Cookson H and others. 'Management of Panton-Valentine leukocidin *Staphylococcus aureus* skin infections in dermatology' British Journal of Dermatology 2012: volume 1, page 46

Corey R and others. 'Safety, tolerability, and efficacy of GSK1322322 in the treatment of acute bacterial skin and skin structure infections' Antimicrobial Agents and Chemotherapy 2014: volume 58, issue 11, pages 6,518 to 6,527

File TM, Jr. and others. 'FOCUS 1: a randomized, double-blinded, multicentre, phase III trial of the efficacy and safety of ceftaroline fosamil versus ceftriaxone in community-acquired pneumonia' Journal of Antimicrobial Chemotherapy 2011: volume 66 upplement 3, pages iii19 to 32

Hefzy EM and others. 'Detection of Panton-Valentine leukocidin-positive methicillin-resistant *Staphylococcus aureus* nasal carriage among Egyptian health care workers' Surgical Infections 2016: volume 17, issue 3, pages 369 to 375

Khoury J and others. 'Eradication of methicillin-resistant *Staphylococcus aureus* from a neonatal intensive care unit by active surveillance and aggressive infection control measures' Infection Control and Hospital Epidemiology 2005: volume 26, issue 7, pages 616 to 621

Low DE and others. 'FOCUS 2: a randomized, double-blinded, multicentre, phase III trial of the efficacy and safety of ceftaroline fosamil versus ceftriaxone in community-acquired pneumonia'. Journal of Antimicrobial Chemotherapy 2011: volume 66 supplement 3, pages iii33 to iii44

Matheson A and others. 'Hiding in plain sight: benefit of abrasion and laceration swabs in identification of Panton-Valentine leucocidin (PVL)-meticillin-resistant *Staphylococcus aureus* (MRSA) colonisation in military personnel' Cureus 2023: volume 15, issue 5, e39487

Muhlebach MS. 'Methicillin resistance in *Staphylococcus aureus* (MRSA)-genetic types and their relevance to CF' Pediatric Pulmonology 2015: volume 41, pages 145 to 147

Muhlebach MS and others. 'Mrsa types in new onset infection-results from star-too trial' Pediatric Pulmonology 2015: volume 41, page 327

Rajendran PM and others. 'Randomized, double-blind, placebo-controlled trial of cephalexin for treatment of uncomplicated skin abscesses in a population at risk for community-acquired methicillin-resistant *Staphylococcus aureus* infection' Antimicrobial Agents and Chemotherapy 2007: volume 51, issue 11, pages 4,044 to 4,048

Rosen T and others. 'Efficacy and safety of Ozenoxacin cream for treatment of adult and pediatric patients with impetigo: a randomized clinical trial' JAMA Dermatol 2018: volume 154, issue 7, pages 806 to 813

Semret M and others. 'Topical mupirocin for eradication of MRSA colonization with mupirocin-resistant strains' Infectious Control and Hospital Epidemiology 2001: volume 22, issue 9, pages 578 to 580

Stryjewski ME and others. 'Efficacy of telavancin in patients with specific types of complicated skin and skin structure infections' Journal of Antimicrobial Chemotherapy 2012: volume 67, issue 6, pages 1,496 to 1,502

Tomayko JF and others. 'The safety and efficacy of topical Retapamulin ointment versus placebo ointment in the treatment of secondarily infected traumatic lesions: a randomized, double-blind superiority study' Advances in Skin and Wound Care 2013: volume 26, issue 3, pages 113 to 121

Tong A and others. 'Panton-Valentine leukocidin is not the primary determinant of outcome for *Staphylococcus aureus* skin infections: evaluation from the CANVAS studies' PLoS ONE [Electronic Resource] 2012: volume 7, issue 5, e37212

Wagenlehner FM and others. 'Management of a large healthcare-associated outbreak of Panton-Valentine leucocidin-positive meticillin-resistant *Staphylococcus aureus* in Germany' Journal of Hospital Infection 2007: volume 67, issue 2, pages 114 to 120

Wiese-Posselt M and others. 'Successful termination of a furunculosis outbreak due to lukS-lukF-positive, methicillin-susceptible *Staphylococcus aureus* in a German village by stringent decolonization, 2002 to 2005' Clinical Infectious Diseases 2007: volume 44, issue 11, pages e88 to 95

Not English language (3 studies)

Bock-Hensley O and others. 'Methicillin-resistant *Staphylococcus aureus* in nursing homes' MMW-Fortschritte der Medizin 2009: volume 151, pages 41 to 45

Carre N and others. '[*Staphylococcus aureus*-carrying Panton-Valentine leukocidin genes nasal colonization and skin infection: screening in case of outbreak in a school environment]' Medecine et Maladies Infectieuses 2008: volume 38, issue 9, pages 483 to 488

Kaya S. 'Treatment options of community-acquired methicillin-resistant *Staphylococcus aureus* infection: Medical education. [Turkish]' Turkiye Klinikleri Journal of Medical Sciences 2008: volume 28, pages 956 to 961

No relevant outcomes (4 studies)

Boubaker K and others. 'Panton-valentine leukocidin and staphyloccoccal skin infections in schoolchildren' Emerging Infectious Diseases 2004: volume 10, issue 1, pages 121 to 124

Immergluck LC and others. 'Methicillin-resistant *Staphylococcus aureus* (MRSA) carriage and infection in children from an emergency department (ED)' Clinical and Translational Science 2010: volume 3, page S10

Somayaji R and others. 'Risk factors for methicillin-resistant *Staphylococcus aureus* (MRSA) persistence in persons with cystic fibrosis (CF): analysis of the star-too cohort' Pediatric Pulmonology 2017: volume 52, page 350

Velazquez-Meza ME and others. 'Chlorhexidine whole-body washing of patients reduces methicillin-resistant *Staphylococcus aureus* and has a direct effect on the distribution of the ST5-MRSA-II (New York/Japan) clone' Journal of Medical Microbiology 2017: volume 66, issue 6, pages 721 to 728

Wrong population (12 studies)

Cenizal MJ and others. 'Prospective randomized trial of empiric therapy with trimethoprim-sulfamethoxazole or doxycycline for outpatient skin and soft tissue infections in an area of high prevalence of methicillin-resistant *Staphylococcus aureus*' Antimicrobial Agents and Chemotherapy 2007: volume 51, issue 7, pages 2,628 to 2,630

David MZ and others. 'a randomized, controlled trial of chlorhexidine-soaked cloths to reduce methicillin-resistant and methicillin-susceptible *Staphylococcus aureus* carriage prevalence in an urban jail' Infection Control and Hospital Epidemiology 2014: volume 35, issue 12, pages 1,466 to 1,473

Dryden MS and others. 'A randomized, controlled trial of tea tree topical preparations versus a standard topical regimen for the clearance of MRSA colonization' Journal of Hospital Infections 2004: volume 56, issue 4, pages 283 to 286

Ellis MW and others. 'Targeted intranasal mupirocin to prevent colonization and infection by community-associated methicillin-resistant *Staphylococcus aureus* strains in soldiers: A cluster randomized controlled trial' Antimicrobial Agents and Chemotherapy 2007: volume 51, issue 10, pages 3,591 to 3,598

Hines CM and others. 'Mupirocin resistance in methicillin-resistant *Staphylococcus aureus* (MRSA) colonized residents in long-term care facilities (LTCFs)' Journal of Molecular Diagnostics 2011: volume 13, pages 745 [Link unavailable]

Huang JT and others. 'Treatment of *Staphylococcus aureus* colonization in atopic dermatitis decreases disease severity' Pediatrics 2009: volume 123, issue 5, pages e808 to 814

Kumar N and others. 'High *Staphylococcus aureus* colonization prevalence among patients with skin and soft tissue infections and controls in an urban emergency department' Journal of Clinical Microbiology 2015: volume 53, issue 3, pages 810 to 815

Magyarics Z and others. 'Randomized, double-blind, placebo-controlled, single-ascending-dose study of the penetration of a monoclonal antibody combination (ASN100) targeting *Staphylococcus aureus* cytotoxins in the lung epithelial lining fluid of healthy volunteers' Antimicrobial Agents and Chemotherapy 2019: volume 63, issue 8

Muhlebach MS and others. 'Microbiological efficacy of early MRSA treatment in cystic fibrosis in a randomised controlled trial' Thorax 2017: volume 72, issue 4, pages 318 to 326

Peterson LR and others. 'Reduction of methicillin-resistant *Staphylococcus aureus* infection in long-term care is possible while maintaining patient socialization: a prospective randomized clinical trial' American Journal of Infectious Control 2016: volume 44, issue 12, pages 1,622 to 1,627

Seetulsingh P and others. 'Outbreak of ciprofloxacin-susceptible community-associated meticillin-resistant *Staphylococcus aureus* in a neonatal unit' Journal of Hospital Infection 2008: volume 68, pages 374 to 375

Simor AE and others. 'Randomized controlled trial of chlorhexidine gluconate for washing, intranasal mupirocin, and rifampin and doxycycline versus no treatment for the eradication of methicillin-resistant *Staphylococcus aureus* colonization' Clin Infect Dis 2007: volume 44, issue 2, pages 178 to 185

Wrong publication type (2 studies)

De Angelis G and others. 'Treatment of skin and soft tissue infections due to community-associated methicillin-resistant *Staphylococcus aureus* in Europe: the role of Trimethoprim-sulfamethoxazole0010' Clinical Infectious Diseases 2011: volume 52, issue 12, pages 1,471 to 2,160

Huang DB and others. 'Clinical outcomes by methicillin-resistant *Staphylococcus aureus* staphylococcal cassette chromosome mec type: Isolates recovered from a phase IV clinical trial of linezolid and vancomycin for complicated skin and skin structure infections' Antimicrobial Agents and Chemotherapy 2010: volume 54, pages 4,036 to 4,037

Wrong setting (one study)

Katahira EJ and others. 'Subinhibitory concentrations of tedizolid potently inhibit extracellular toxin production by methicillin-sensitive and methicillin-resistant *Staphylococcus aureus*' Journal of Medical Microbiology 2019: volume 68, issue 2, pages 255 to 262

Wrong study type (45 studies)

Abrahamian FM and others. 'Management of skin and soft-tissue infections in the emergency department' Infectious Disease Clinics of North America 2008: volume 22, issue 1, pages 89 to 116

Anderson J and others. 'Community-associated methicillin-resistant *Staphylococcus aureus*' U.S 2007, pages HS3 to HS12

Avdic E and others. 'Management and control strategies for community-associated methicillin-resistant *Staphylococcus aureus*' Expert Opinion on Pharmacotherapy 2008: volume 9, pages 1,463 to 1,479

Bagge K and others. 'Eradicating MRSA carriage: the impact of throat carriage and Panton-Valentine leukocidin genes on success rates' European Journal of Clinical Microbiology and Infectious Diseases 2019: volume 38, issue 4, pages 683 to 688

Balakirski G and others. 'Recurrent mucocutaneous infections caused by PVL-positive *Staphylococcus aureus* strains: a challenge in clinical practice' Journal der Deutschen Dermatologischen Gesellschaft 2020: volume 18, issue 4, pages 315 to 322

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Fry DE. 'The continued challenge of *Staphylococcus aureus* in the surgical patient' American Surgeon 2013: volume 79, pages 1 to 10

Fusco NM and others. 'Antibiotic management of methicillin-resistant *Staphylococcus aureus*-associated acute pulmonary exacerbations in cystic fibrosis' Annals of Pharmacotherapy 2015: volume 49, issue 4, pages 458 to 468

Gadelsayed MN and others. 'Methicillin-resistant *Staphylococcus aureus* (Panton-Valentine leucocidin) cavitating pneumonia in a healthy child' Archives of Disease in Childhood 2012: volume 97, issue 11, pages 980 to 981

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George SM and others. 'Interventions to reduce *Staphylococcus aureus* in the management of eczema' Cochrane Database Syst Rev 2019: volume 2019, issue 10

Gros C and others. 'Skin and soft tissue infections due to *Staphylococcus aureus* producing Panton-Valentine leukocidin toxin in the Nord-Pas-de-Calais region, northern France, 2004 to 2008' Clinical Microbiology and Infection 2010: volume 2, pages S285 to S286

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