Topical antibiotics for wound infection

Background

• NQ highest rate skin cancer in world

• Majority managed by GPs

• High rate of surgical site infection

• BMJ paper 2009 Topical chloramphenicol

• 11.0% to 6.6% - statistical not clinical significance
Existing Evidence

- RCTs with conflicting results
- RCTs underpowered
- Systematic reviews concluding lack of efficacy and lack of evidence
- Consensus clinical community not to use
<table>
<thead>
<tr>
<th>Literature</th>
<th>Conclusion</th>
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| **Huiras et al. 2012**       | Limited evidence  
- efficacy uncertain |
| Local antimicrobial administration for prophylaxis of surgical site infection |
| **Rosengren et al. 2010**    | Limited evidence |
| Antibacterial prophylaxis in dermatologic surgery |
| **Grey et al. 2009**         | Limited evidence |
| Antibiotic prophylaxis for minor dermatological surgery in primary care |
| **Mc Hugh et al. 2011**      | Limited evidence |
| The role of topical antibiotics used as prophylaxis in surgical site infection prevention |

↑ Impact  
SSI  

↑ costs  
Complicated infections  
Ugly scarring  
Delayed healing  
↑ use resources
Methods - Population

- Randomised control trials
- Children and adults
- All wound classes
- Heal by primary intention
- Hospital and Primary care
- General surgery and dermasurgery

Intervention/control

- All classes of antibiotic
- Topical application
- Post-operative application
- Antiseptic control
- Inert ointments
- No treatment control
Primary Outcomes

- Rates of SSIs
- Incidence adverse effects
- Allergic contact dermatitis
- Antibiotic resistance
- Anaphylaxis

Secondary Outcomes

- Wound healing
- Patient satisfaction
- Quality of life
- Number needed to treat

Part 1 results
The Evidence

- 15 RCTs
- 10 studies – meta-analysis (n=5100)
- Most published 90’s, some 70’s and 80’s, most recent 2014
- Poor reporting of methods (pre-consort)
- Some studies only analyse outcomes for patients who completed treatment (no ITT analysis)
- Low post randomisation drop out rate
- Definition of outcome surgical site infection varied
- 2 trials pharmaceutical sponsorship

Included studies

15 studies
- Minor procedures
  - 6 studies
- Major procedures
  - 9 studies
- Class 1 - Clean
  - 3 studies
- Class 2 - Clean/contaminated
  - 8 studies
- Class 3 - contaminated
  - 4 studies
- Class 4 - dirty
  - 0 studies
Antibiotics
- Triple antibiotic ointment
- Chloramphenicol
- Neomycin
- Bacitracin
- Rifamycin
- Mupirocin
- Soframycin
- Metronidazole
- Fusidic acid

Controls
- No treatment
- Alternative topical antibiotic
- Inert topical control
- Topical antiseptic

Risk of bias
- 8 High risk
- 7 Unclear or low risk

High risk of bias indicators:
- Random sequence generation
- Allocation concealment
- Assessor blinding
SSI rates

- 10 studies
  - RR 0.59 [0.47-0.74]
  - \( p < 0.0001 \)
  - \( I = 25\% \)

- 5 studies
  - RR 0.49 [0.36-0.67]
  - \( p < 0.0001 \)
  - \( I = 0\% \)

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Surgical site infection

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Total events: 931 | Total events: 227

Footnotes:
(1) Four arm trial. The two topical antibiotic arms have been grouped as the experimental, and the antibiotic and paraffin arms have been grouped as the control arm.
(2) Four arm trial. The three control arms utilise trihalone have been grouped together for this comparison.
(3) Three arm trial. The paraffin and no-treatment control arms have been combined into the control arm.

Surgical Site Infection

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Footnotes:
(1) Four arm trial. The two topical antibiotic arms have been grouped as the experimental.
(2) Random sequence generation (selection bias)
(3) Allocation concealment (selection bias)
(4) Blinding of outcome assessment (detection bias)
(5) Incomplete outcome data (attrition bias)
(6) Selective reporting (reporting bias)
(7) Other bias
SSI- Subgroup analysis

- More effective in Class 3 than Class 1
- More effective in General than Dermasurgery
- Neomycin and Choramphenicol more effective than Mupirocin

Allergic Contact Dermatitis

- 4 studies
  - RR = 1.51 [0.45-5.09]
  - p < 0.50
- 3 studies
  - RR = 5.3 [0.61-45.69]
  - p < 0.13
Allergic Contact Dermatitis

- 5 studies
- RR = 0.85 [0.64 – 1.12]
- p < 0.24

Healing
Healing

- No patterns of antibiotic resistance (5 studies)
- No anaphylaxis
- No patient satisfaction
- No cost analysis
Discussion

- 10 trials, some high risk of bias
- Surgical Site Infection
  - Moderate effect (N=10, RR 0.59(CI 0.3-0.7))
  - High Quality (Risk of bias, heterogeneity, precision)
- Allergic Contact Dermatitis
  - Minor effect (N=4, RR 1.5(0.5-5.3))
  - Low Quality (High risk of bias, high heterogeneity, precision)

Discussion

- Dixon trial different
- Used mupirocin (bactroban)
- ? Less effective
Conclusion

• **Topical antibiotics** - half risk of SSI - strong evidence

• **50% increase risk allergic contact dermatitis** - weak evidence

• **Use with caution** - ? High risk wounds

• **Chloramphenicol and neomycin more effective**

• **More higher quality studies** - adverse effects

Acknowledgments

We thank

• The Cochrane Wound Group for ongoing support
References


