Critically Appraised Topic

Prophylactic oral antibiotics for low-risk dog bite wounds

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Clinical scenario

A young woman has been bitten by a dog three hours ago. She has puncture wounds and a small laceration on her forearm. Is their evidence for the prescription of prophylactic antibiotics?

Clinical question/ PICO

In adults with dog bite wounds, do prophylactic antibiotics reduce the incidence of wound infection?

P = adults with recent, uncomplicated, dog bite wounds
I= antibiotics
C= placebo
O = incidence of wound infection

The preferred study type: randomized controlled trials (RCTs) or Systematic Reviews of RCTs

Search strategy

PubMed:
("Bites and Stings"[Mesh] OR bite*[TIAB]) AND ("Dogs"[Mesh] OR dog*[TIAB]) AND ("Anti-Bacterial Agents"[Mesh] OR "Antibiotic Prophylaxis"[Mesh] OR "Anti-Bacterial Agents" [Pharmacological Action] OR antibiotic*[TIAB]) + Haynes' filter for Systematic Review/ Therapy narrow (Clinical Queries).
PubMed result: 352 papers, of which 10 systematic reviews and 8 randomized trials (search date March 1 2012)

Cochrane Library:
dog* bite* antibiotic* (ti,ab,kw)
Cochrane result: 1 Cochrane Review and 9 trials (search date March 1 2012)

Search outcome

From the 10 systematic reviews (and one duplicate), the Cochrane Review was included.
Out of 17 trials, 7 were duplicates; 4 RCTs were included in the Cochrane Review; 5 trials were irrelevant or not adequate (not randomized). One remaining, recent, RCT and cost-effectiveness study was included for critical appraisal.

Results

Key results of the Cochrane systematic review and RCT are summarized in the evidence table below

Ref	Patient group and intervention	Study type	Outcome	Key results	Study weaknesses
Medeiros H.S. 2001	463 dog bite patients (6 RCTs) Treatment vs control: -Phenoxymethyl penicillin 5 days + wound care vs local wound care only -Dicloxacillin or cephalexin or erythromycin 7 days vs placebo - Oxacillin 5 days vs placebo -Cotrimoxazole vs placebo -Cloxacillin or dicloxacillin vs placebo -Phenoxymethyl penicillin 2 days vs placebo	Cochrane Syst Review Level 1a	Incidence of infection	Infection rate in treatment group: 4% (10/225) Control group: 5.5% (13/238) Odds Ratio 0.74 95% C.I. [0.30, 1.85]	Small sample sizes. 1/6 study was quasi-randomized; 5/6 studies not clear about allocation concealment Differences in antibiotic type and regimen; one study is not placebo-controlled
Quinn 2010	94 dog bite patients. Treatment vs control was 3day prophylactic amoxicillin-calvulanic acid vs placebo	RCT + cost effectiveness Level 1b	Incidence of infection	Infection rate in treatment group: 0% (0/48) Control group: 4% (2/46) ARR (abs risk red) 4% (95% C.I. -1 to 4.5%)	Small sample; 29% of eligible patients refused to participate

Comments

The overall infection rate for dog bites in all included studies was 4.5% whether or not antibiotics were prescribed. According to the cost model of Quinn prophylactic antibiotics are cost effective if the risk of wound infection is greater than 5% and if antibiotics decrease that risk by greater than 3%. And it is never cost effective to treat wounds with an infection rate of less than 3%.
Antibiotics may be (cost-) effective for high-risk dog bites with a high risk of wound infection.

Clinical bottom line

There is no evidence for the effectiveness of prophylactic antibiotics for uncomplicated dog bites.

References

Medeiros I, Saconato H. Antibiotic prophylaxis for mammalian bites. Cochrane Database Syst Rev. 2001;(2):CD001738. PMID: 11406003

Quinn JV, McDermott D, Rossi J, Stein J, Kramer N. Randomized controlled trial of prophylactic antibiotics for dog bites with refined cost model. West J Emerg Med. 2010 Dec;11(5):435-41. PubMed PMID: 21293762