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Management of Complicated Intra-Abdominal Infections (Systematic Review)

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BACKGROUND

- Complicated Intra-Abdominal Infection (CABI) is defined as an infective process that extends beyond an organ and into the peritoneal space causing peritonitis, and is associated with increased morbidity and mortality. [1,2]
- The treatment strategies for CABI are based on administration of antibiotics and source control procedures (using radiological guided or surgical approaches).
- Guidelines for the management of CABI were recently published, however they do not provide comprehensive evidenced based recommendations and are based on limited scientific evidence [2,3]. The optimal antibiotic strategy for the management of CABI is therefore still unclear.
- We therefore conducted a systematic review to produce a comprehensive review of the evidence of antibiotics in CABIs

OBJECTIVES

1. **To determine the optimal antibiotic strategy for CABI with regard to:**

a) **Antibiotic class**
b) **Duration**
c) **Type of administration (e.g. Intravenous vs. Oral)**

METHODS

The systematic review was conducted using articles retrieved from the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (Ovid) and PubMed. Relevant article reference lists were hand searched, MESH headings used.

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2090 series found

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54 Full-text articles assessed for eligibility

Inclusion criteria: All RCTs that assess the effectiveness of a treatment strategy (use of source procedure or antibiotics) in patients diagnosed with a CABI

Exclusion: Non-randomised trials; uncomplicated intraabdominal infection; liver abscess; primary peritonitis (e.g. Spontaneous bacterial peritonitis)

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36 Studies included in qualitative synthesis

18 articles excluded
Failed to meet inclusion criteria (13)
Data reused from another study already included in systematic review (3)
Not in English (2);

RESULTS

This systematic review identified 36 relevant RCTs with 8594 patients, 19 different antibiotics and six distinct source control procedures.
No RCTs compared source control against antibiotic therapy only for the treatment of CABIs.

1a) No optimal antibiotic class was identified for the treatment of CABIs
No significant differences in mortality was found at 1 month with the following comparators:

- Carbapenems vs. Cephalosporin based regimens: (Figure 1, OR: 1.04, n=6). Incidence of complicated appendicitis was 32.7-64.9%
- Carbapenems vs. Penicillin-β-lactamase inhibitor combinations: (OR: 1.42, 95% CI; 0.46, 4.39, I2=57%, n=3).
- Carbapenems vs. Fluoroquinolone based regimens: (OR: 0.93, 95% CI: 0.32, 2.72, I2=72%).
- Tigecycline vs. Cephalosporin based regimens (OR: 1.52, 95% CI: 0.68, 3.44, I2=0%)
- Penicillin-β-lactamase inhibitor combinations vs. Cephalosporin based regimens (OR=1, n=1)

Clinical cure was reported in 14 different time-points. Therefore, the "clinical cure" analysis was categorized into three time points of equal length in order to perform efficacy analysis. No significant differences was identified in cure rate with the above antibiotic comparators.

b) Our review did not identify a recommended duration for antibiotic treatment of CABIs
Only one RCT studied duration of antibiotic therapy in patients who had undergone source control[4].
There was no significant differences in mortality (Absolute difference 0.4%, 95% CI: -1.7, 2.7) at 1 month between short course antibiotics (median 4 [IQR: 4-5]) vs. long course antibiotics (median 8 days [IQR: 5-10]. No comparisons of short course (< 10 days))versus longer course (>21 days), or of duration without source control, were identified.

c) There were no RCTs that compared the same antibiotic regimen given by different routes of administration

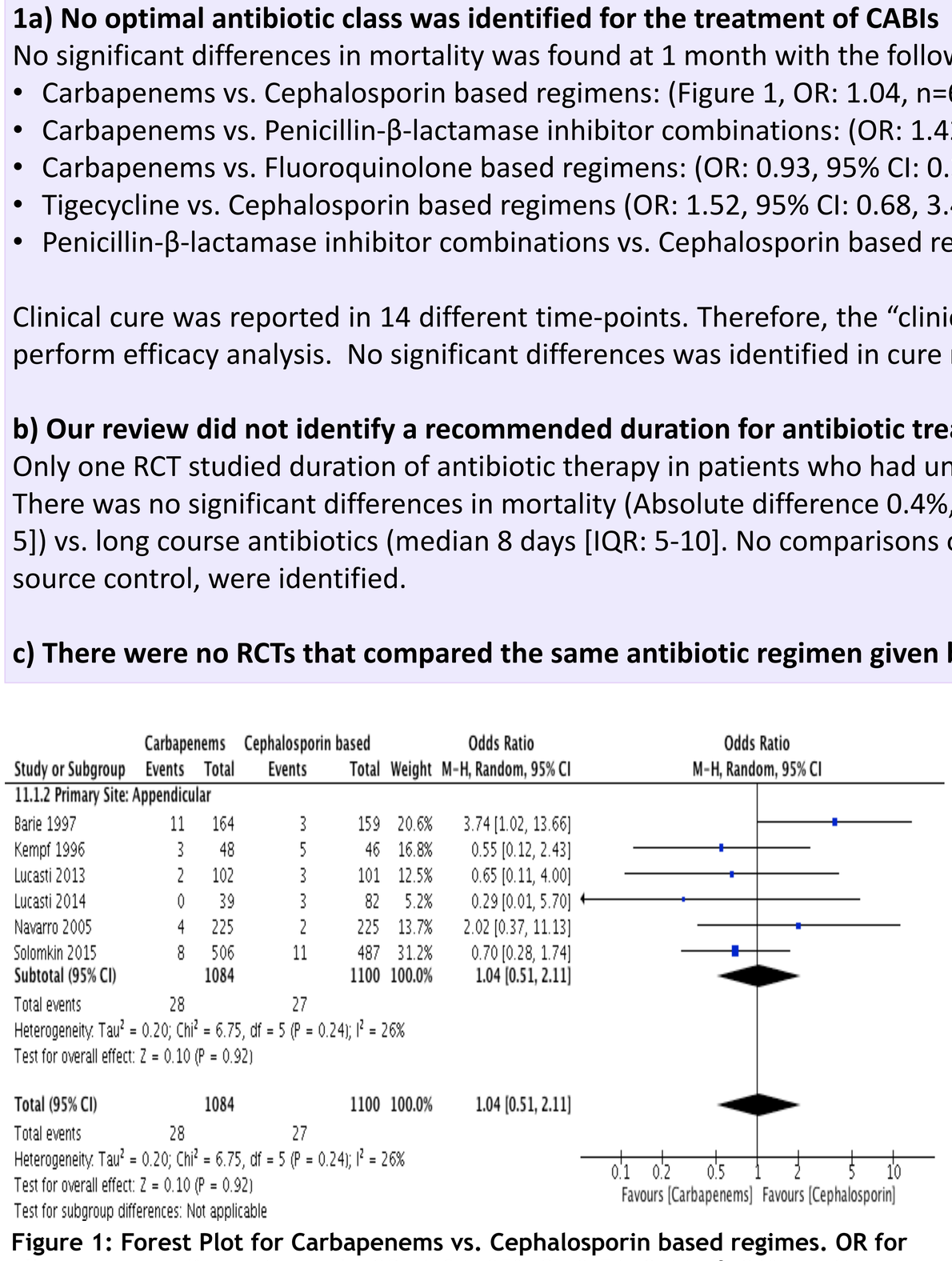

Figure 1: Forest Plot for Carbapenems vs. Cephalosporin based regimes. OR for all-cause mortality at 1 month. OR: 1.04, 95% CI; 0.51, 2.11, I^2=26%, n=6).

CONCLUSIONS

Our review did not identify an optimal antibiotic strategy for CABIs. Further RCTs are required to evaluate optimal antibiotic strategy in CABIs originating from other sites than the appendix and length of treatment.

This systematic review demonstrates the need for RCTs in CABIs with standardisation in outcome reporting to allow results of multiple trials to be compared [5].

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