**Efficacy of Local Infiltration Anesthesia in Dentistry: A Systematic Review**

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**RATIONALE**

- Local anesthetics = most important drugs in dentistry  
- Generally effective, although failure remains a problem  
- Dentists are offered a number of solutions to choose from!

**VARIETY**

MAKING THE CHOICE  
Expert Recommendations        -vs-        Clinical Data  
Making Evidence-Based Decisions

**EVIDENCE-BASED PRACTICE**

- SYSTEMATIC REVIEWS:  
  - Valid and unbiased summaries  
  - Transparent methods  
  - Benefit clinicians  
  - Making informed decisions.

**Aims of this Research**

- The aim of this investigation was to systematically review the literature to clarify the level of evidence that exists supporting the efficacy of the available anesthetic solutions approved for clinical dentistry when given by means of local infiltration.
METHODS

- **Electronic Search Strategy**:
  - **Medline, EMBASE**
  - MedSH terms
  - 422 potential studies identified.
- Handsearching to enrich the results.

**METHODS**

- **INCLUSION CRITERIA**:
  - randomized, controlled trials
  - adult subjects
  - proper assessment of pulpal anesthesia
  - infiltration anesthesia administered
- Final list of included studies agreed upon by consensus

INCLUDED TRIALS

<table>
<thead>
<tr>
<th>ANESTHETIC</th>
<th>DENTAL ARCH</th>
<th>RANGE OF SUCCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articaine</td>
<td>Maxilla</td>
<td>65-100%</td>
</tr>
<tr>
<td>Bupivacaine</td>
<td>Mandible</td>
<td>63-92%</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>Maxilla</td>
<td>64-78%</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>Maxilla</td>
<td>62-100%</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>Mandible</td>
<td>39-67%</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>Maxilla</td>
<td>65-90%</td>
</tr>
<tr>
<td>Prilocaine</td>
<td>Mandible</td>
<td>50-53%</td>
</tr>
</tbody>
</table>

**RESULTS**

- ANESTHETIC SUCCESS RATES:
  - Articaine: Maxilla 65-100%
  - Bupivacaine: Maxilla 64-78%, Mandible 63-92%
  - Lidocaine: Maxilla 62-100%
  - Prilocaine: Maxilla 65-90%, Mandible 50-53%

**Figures**

- Flow chart of manuscripts screened through the review process.
Sources of Heterogeneity

- Differences in study design/methodology:
  - Operators/Evaluators
  - Randomization, Blinding
  - Age/Gender of Subjects, and Sample Size
  - Various dosages and delivery techniques
  - Different tooth selection and pre-operative pulpal status
  - Determination of anesthetic efficacy, definition of success

Implications for Clinical Practice

- Volume matters!
  - Articaine - similar to other local anesthetics
  - Superiority* of Articaine - in 7 of 10 comparative trials
    - Statistically significant in only 3 of these studies.
  - Due to heterogeneity of included studies, further clinical trials are needed.

Implications for Future Research

- Optimal quality of randomized controlled trials:
  - Sufficiently blinded and randomized.
  - Proper determination of sample size.
  - Clearly defined outcomes, and description of valid outcomes measurements.
  - Reporting of adverse events.

Questions?