The critical blood-sparing effect of tranexamic acid in liposuction: a systematic review and meta-analysis

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Background
Background

SPECIAL TOPIC

Safety and Efficacy of Local Tranexamic Acid for the Prevention of Surgical Bleeding in Soft-Tissue Surgery: A Review of the Literature and Recommendations for Plastic Surgery

The Role of Tranexamic Acid in Aesthetic Plastic Surgery: A Survey of the British Association of Aesthetic Plastic Surgeons

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REVIEW ARTICLE

Tranexamic Acid Prophylaxis in Hip and Knee Joint Replacement

Matthias Goldstein, Carsten Feldmann, Hinnerk Wulf, Thomas Wiesmann

Tranexamic acid in gynecologic surgery

Andrew Zakhari 1, Ari Paul Sanders 1,2, Meir Jonathon Solnik 1

Affiliations + expand
PMID: 31865770 DOI: 10.1080/03007995.2019.1708533
Aim

• Determine the impact of TXA use in blood loss after liposuction procedures.

• Determine if TXA use in liposuction changes the morbidity profile of the procedure.
Methods
Methods

• A systematic literature search was performed using: PubMed, EMBASE, CINAHL, Cochrane Central, ClinicalTrials.gov, and WorldWideScience.org databases from their inception to October 8, 2021.

• List of search terms under 3 broad topics:
  
  • 1) TXA
  
  • 2) Liposuction
  
  • 3) Complications
Inclusion & Exclusion Criteria

• Studies were included based on the following criteria:
  • Articles evaluating potential blood-sparing effects of TXA in liposuction

• Studies were excluded based on the following criteria:
  • Non-English publication
  • Review article or protocol paper
  • Conference abstracts
  • Animal studies
  • Survey study
Results
Literature Search

• The search resulted in 759 studies (206 from grey literature sources)

• PubMed (NLM) from inception to 10/08/2021 (62 Results)

• Embase (Elsevier) from inception to 10/08/2021 (376 Results)

• CINAHL (EBSCOHost) from inception to 10/08/2021 (41 Results)

• Cochrane Central (Wiley) from inception to 10/08/2021 (74 Results)

• 74 duplicate studies were found and omitted using Endnote X.20

• 685 references were eligible to screen
Systematic review search topics:
TXA AND Liposuction

685 articles identified

14 articles evaluated

5 articles studying TXA and liposuction were utilized

Articles not related to TXA and liposuction (n= 671)

9 studies failed to meet criteria and were rejected:
Systematic Reviews (n= 7)
Opinion pieces (n=2)
Results

• 5 studies met our inclusion criteria:
  • One retrospective and 4 prospective (3 randomized) studies

• TXA was utilized in various forms:
  • IV either on induction or after the procedure
  • Mixed into the tumescent solution
  • Infiltrated into the liposuction sites after lipoaspiration
Meta-Analysis: Aspirated Volume

### Aspirated Volume

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment</th>
<th>Control</th>
<th>Mean diff. with 95% CI</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cansancao</td>
<td>N=10</td>
<td>N=10</td>
<td>0.57 [-0.81, 1.94]</td>
<td>40.71</td>
</tr>
<tr>
<td>Rodriguez-Garcia</td>
<td>N=25</td>
<td>N=25</td>
<td>1.90 [0.76, 3.04]</td>
<td>59.29</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td></td>
<td></td>
<td>1.36 [0.48, 2.23]</td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: $I^2 = 53.41\%$, $H^2 = 2.15$

Test of $\theta = 0$: $Q(1) = 2.15$, $p = 0.14$

Test of $\theta = 0$: $z = 3.03$, $p = 0.00$

Fixed-effects inverse-variance model
Meta-Analysis: HCT Reduction

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment</th>
<th>Control</th>
<th>Mean diff. with 95% CI</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cansanco</td>
<td>10</td>
<td>10</td>
<td>-1.50 [-3.61, 0.61]</td>
<td>18.64</td>
</tr>
<tr>
<td>Rodriguez-Garcia</td>
<td>25</td>
<td>25</td>
<td>-2.50 [-3.51, -1.49]</td>
<td>81.36</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>25</td>
<td>25</td>
<td>-2.31 [-3.22, -1.40]</td>
<td></td>
</tr>
</tbody>
</table>

Heterogeneity: $I^2 = 0.00\%$, $H^2 = 1.00$

Test of $\theta_i = \theta$; Q(1) = 0.70, p = 0.40

Test of $\theta = 0$: z = -4.98, p = 0.00

Fixed-effects inverse-variance model
Results

• Patients in non-TXA cohorts experienced adverse effects (such as seroma and need for transfusion) that were not seen in TXA cohorts.
Conclusions
Summary

• The highest level of evidence available demonstrates a beneficial blood-sparing effect of TXA use in liposuction.

• Future studies should aim to determine the optimal route of administration and dosing for TXA use in liposuction.
Thank you!