Application of tactile/kinesthetic stimulation in preterm infants: a systematic review

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About me:

- Physical Therapist (2002)
- Osteopathy (2007)
- Touch Therapy Research Workshop – Dra Tiffany Field (2011)
- Private practice with babies
The first little baby

Mother: “Now what? And the children who are in the NICU? Vain all do surgery?”
Resume

✓ Objective
✓ Method
✓ Inclusion criteria
✓ Results
✓ Conclusion
TKS has been studied as an aid to standard treatment

Growth and Development
minimizing stress
Benefits

✓ Increased weight gain 3,6-10,14-37,39

✓ Reduced length of hospital stay 10,16,17,20,21,23,24,28,31,32,35,37,39

✓ Reduced stress behaviors 11

✓ Improved neurobehavioral responses 6-8,10,14,19-23,25,26,36,39

✓ Late-onset sepsis 16

✓ Effect on the immune system 32
The Technique

✓ Simple procedure
✓ Low cost
✓ Non-invasive

Still need more studies
To verify the methods used by the clinical trials that assessed the effect of tactile/kinesthetic stimulation on weight gain in preterm infants and highlight the similarities and differences among such studies.
Method

Systematic Review

2 databases: PEDro and PubMed (July-2014)

1) Title
2) Abstract
3) Texts

(thoroughly read to select those that met the inclusion criteria)
Inclusion Criteria

- Clinical trials TS or massage therapy whether or not associated with KS of PI
- That assessed weight gain after the intervention
- Control group
- Were composed in English, Portuguese, or Spanish
<table>
<thead>
<tr>
<th>Title/Author/Year/Database</th>
<th>Sample Size</th>
<th>Objectives and starting conditions</th>
<th>Description of the technique</th>
<th>Main Variables</th>
<th>Measured weight gain</th>
<th>Description of adverse events during the procedure</th>
<th>Results achieved statistical significance</th>
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</thead>
<tbody>
<tr>
<td>Massage therapy improves neurodevelopment outcome at two years corrected age for very low birth weight infants</td>
<td>Total: 73</td>
<td>Assess the outcome of MT growth and neurodevelopment of PI assessed at 2 years corrected age. Beginning after 48 h of life.</td>
<td>MT applied only by mothers, 4x/day for 15 min, intervals of 6 hours of TS: temporal, frontal, periorbital, nasal, and perilabial regions of the face and the external side of the upper and lower limbs + KS (3x each: wrist, elbow, ankle, and knee)</td>
<td>1) Anthropometric</td>
<td>Body weight taken with normal nursery routine</td>
<td>Mothers of the TG were instructed to observe the newborns' tolerance signs, avoiding excessive stimulations.</td>
<td>2) TG: Greater mental development index (p = 0.035)</td>
</tr>
</tbody>
</table>
Results

Making the revision we have seen that most studies (14 of 31) follow the protocol proposed by Dr. Field in 1986.
Tactile Kinesthetic Stimulation

FASE 1
- Tactile stimulation
- Prono position

FASE 2
- Kinesthetic stimulation
- Supine position

FASE 3
- Tactile stimulation
- Prono position
20 of the 31 studies described a significantly benefit on weight gain in the PI group that received the TS/TKS
Correlations faster weight gain and TKS

- **Greater vagal stimulation**\(^{28,29}\)
- **Greater gastric activity** \(^{28,29}\)

- More relaxed \(\rightarrow\) Lower heart rates \(\rightarrow\) Lower energy expenditure \(\rightarrow\) Faster weight gain

- Some studies using only KS obtained results not only in greater weight gain but also in bone mineralization. \(^{45-48}\)
Analyzing the Technique

Older studies: did not specify

✓ Which parts of the body were stimulated or how often

✓ The pressure used during the intervention and its duration
Analyzing the Technique

- **White & Labarba** were the first to combine TS and KS.

- In 1981, *Rausch* divided TKS into 3 phases of 5 min and applied TKS only when the PI were awake, without changing their position in the incubator.

- *Scafidi et al* standardized the three 5 min phases into prone TS + supine KS + prone TS.
Analyzing the Technique

- Some studies used some type of oil to reduce friction on the PI’s skin\textsuperscript{14,17,33-35}

- Ferber et al\textsuperscript{15} suggested that during the first 10s of TS, the caregiver should only rest his hand on the PI, avoiding movements

- Dieter et al\textsuperscript{27} was the first to provide TKS for only 5 days
Analyzing the Technique

- *Diego et al*\textsuperscript{28} moderate pressure promoted better outcomes than the group who received light pressure.

- Also, in another time, trained a few therapists and suggested that the technique was effective, regardless of therapist.

- *Massaro et al*\textsuperscript{31} tested TKS and TS separately in different groups of infants and found that TKS appears to be better.
Adverse Events

INTERRUPT THE PROCEDURE

- Stress or uninterrupted crying for more than 60 seconds$^{26}$
- Defecation$^{14}$
- Increased heart rate >200$^{19,27}$
- Decrease heart rate <100 for 12s$^{19,27}$
- Oxygen Saturation level less than 90% for more than 30s$^{19}$
Some authors considered some signs in the 24 hours that preceded the intervention to suspend the procedure:

- Fussing
- Vomiting
- Growing oxygen demand
- Frequent episodes of apnea
- Bradycardia
- Desaturation
- Interventions conducted within the 30 min that preceded TKS, such as sight and hearing tests

Adverse Events
Analyzing the technique

Most of the studies did not provide a detailed description of how to proceed during the stimulation if adverse events occur, nor which are and neither of the possible effects of these events on the outcomes.
Adverse Events

- Exchange of oximeter
- Use of pacifiers
- Routine medical examination just before the procedure
- Diaper
- Some other position to calm the baby
Conclusion

No protocol if adverse events occur

Various ways to apply technique

Even discrete gains in this population can result in long-term benefits

Benefits of TKS

Describe the adverse events that can occur during the procedure

Following protocols

Raise the level of methodological rigor

Continue studying since the evidence found are positive

future studies

QUALITY OF LIFE