

Impact of Foot Massage for Lower Leg Edema in Late Pregnancy

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Abstract

Background: Leg oedema in late pregnancy can cause pregnant pain to the pregnant woman, feelings of heaviness, night cramps and paraesthesiae. Foot massage is suggested as treatment for this problem. **Aim of work:** to evaluate the effect of foot massage in reducing ankle and foot edema at late pregnancy. **Subjects and Methods:** Sixty women from Helal Hospital in Bakkos in Alexandria were randomized to one of two groups; the experimental group received foot massage and the control group didn't receive it. Circumference measurements of ankles (1), insteps (2) and foot/toe junctions (3) were recorded before and after intervention.

Results: After applying foot massage, significant reductions in all of the studied measurements were found in the experimental group as shown by the paired test comparison. Also, patients in the experimental group had significantly lower levels of most of the studied measurements when compared with the control group after implementation of the study intervention.

Conclusions: Foot massage may be an effective intervention for relief of lower leg edema in late pregnancy. Foot massage as pure nursing intervention in late pregnancy is highly recommended in order to relieve lower leg edema and pain.

Introduction

Leg oedema from venous insufficiency in late pregnancy is not dangerous but it can cause pregnant women symptoms such as pain, feelings of heaviness, night cramps and paraesthesiae⁽¹⁾ It occurs as a result of the pressure of the gravid uterus, which impedes venous return; prostaglandin-induced vascular relaxation; and reduced plasma colloid osmotic pressure⁽²⁾ According to the National Institutes of Health edema is unnatural swelling of the body part . usually occurring in the feet and legs , it is caused by fluid build up in the tissues ⁽³⁾ . In order to understand oedema , needs to consider the various factors responsible for moving fluids in and out of blood vessels into the interstitial fluid compartment . Interstitial fluid is fluid that has leaked out of blood capillaries . Capillaries have thin walls with variable gaps between endothelial cells. Structurally leaky , it is easy for fluid and other small particles to move out of them into the interstitium. But the gaps are too small for blood cells to exit. The interstitial fluid has a similar composition to that of blood expect for cells and large proteins. In addition to the permeability of capillaries, other forces play an important part in fluid movement ^(3,4).The mainstays of management are compression stockings and elevation of the extremities⁽⁵⁾ Other studies have examined the oedema relieving effectiveness of a variety of treatments such

as pneumatic compression boots water immersion and bed rest^(6,7) Recently, Oh and Yoon suggested that massage was effective for relieving lower extremity edema and pain. The authors proposed that standardized massage should be applied as a method for physiological lower extremity edema and pain ^(7,8).From a nursing and midwifery point of view, a therapy or treatment for the relief of common discomforts of pregnancy such as oedema should avoid drugs that may be a risk to the unborn baby, be women friendly and fit within a holistic model of care⁽⁹⁾ Consequently, many midwives and women are looking for complementary therapies such as massage⁽¹⁰⁾.However foot massage in late pregnancy not only improves the condition of edema but also has been widely applied to improve health and reduce stress during the third trimester of pregnancy. The study suggests that regular foot massage is beneficial in terms of decreasing physiological lower leg edema in healthy women without obstetric complication

Aim of the Study

The present study aims to evaluate the effect of foot massage in reducing ankle and foot edema at late pregnancy.

Subjects and Methods

Study design and randomization

The present study is a preliminary randomized controlled trial. Sixty women who fulfilled the inclusion criteria of the

study were randomly assigned to one of two equal study groups by simple randomization using a computer software. After randomization, homogeneity of the studied groups regarding age, gestational age and calculated body mass index was assured using the appropriate statistical tests.

Selection of patients

Patients were selected from Eehelal hospital in Bakkos to participate in the study if they fulfilled the inclusion criteria including: (a) normal pregnancy greater than 30 weeks gestation (b) visible oedema of ankles and feet. The exclusion criteria were the presence of diagnosed pre-eclampsia, eclampsia, systemic coexisting disease and local disease associated with edema or deformity of ankle and feet

Foot massage protocol

Foot massage is manipulation of soft tissue of the foot and is more general and does not focus on specific areas that correlate with other body parts. The intervention consisted of a 20 min massage daily for 3 days. The director of the place the researcher in asking the pregnant women attended the clinic each day. These foot massages were administered by the same investigator, who was trained in foot massage by a professional masseur. Baby oil was used during the foot massage to prevent friction and possible resultant discomfort.

The study used a standard massage

technique without pressure. The massage started with the foot being held firmly, then stroked in its entirety from the toes to ankle along the top of the foot using the whole hand, and returning under the foot to the toes using less pressure. The second movement involved thumbs kneading the foot from the toes to the ankle while supporting the foot with the fingers underneath. The skin surface between each tendon on the top of the foot was then stroked one after another using thumbs. The foot was then grasped with both hands and gently manipulated from side to side. The toes were then held with one hand whereas the other hand supported the foot and the toes were gently bent backwards and forwards. Each of these movements was carried out 10 times in succession. The right foot was always massaged before the left and the same method was used for each foot in turn.⁽¹²⁾

Outcome measurements

Circumference measurements of ankles (1), insteps (2) and foot/toe junctions (3) were recorded on plain paper tapes as shown in fig. (1). The ankle circumference (1) was measured medially and laterally above the malleoli, where the diameter was smallest. The instep circumference (2) was measured over the cuneiform and cuboid bones distal to the heel, and the third circumference (3) was measured on the distal end of the foot, at the metatarsal-phalanges joint (where toes joins the foot).

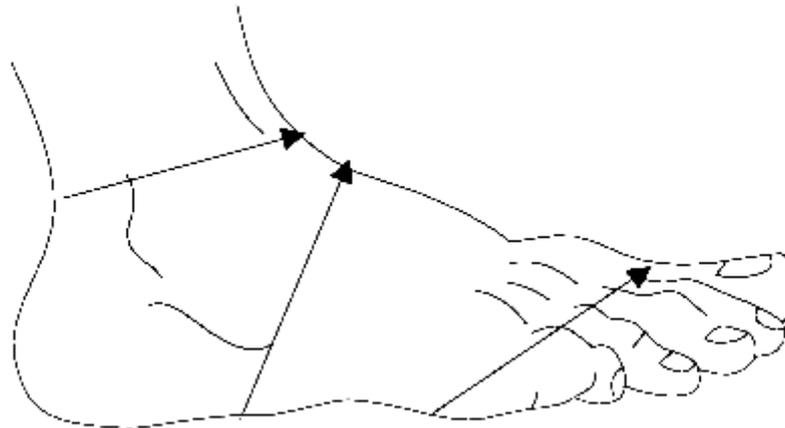


Figure (1)

Statistical analysis

Statistical analysis was achieved using the Statistical Package for Social Science 11.0 computer program (SPSS Inc., an IBM company, Chicago, IL, USA). Numerical data were represented in the form of mean \pm SD while categorical data were represented in the form of number and percent. Student t test was used to compare the basic study findings while paired student t test was used to compare the study measurement throughout the study stages.

Results

Comparison between the basic findings in the studied groups is shown in table-1. No statistically significant differences were noted between the studied groups regarding patients age ($p=0.53$), gestational age ($p=0.96$) and BMI ($p=0.68$). Comparison between the study measurement at baseline and after massage in the studied groups is

shown in table-2. Prior to intervention, no statistically significant differences were noted between the studied groups regarding all the study measurements. After applying foot massage, significant reductions in all of study measurements were found in the experimental group as shown by the paired test comparison. Also, patients in the experimental group had significantly lower levels of most of the study measurements when compared with the control group after implementation of the study intervention.

Comparison between the mean differences of the study measurements in the studied groups before and after implementation of foot massage is shown in table-3. It is clear that the experimental group had significant differences in all the study measurements when compared with the control group

Table-1 Comparison between the studied groups regarding the basic findings

	Study Group (n=30)	Control group (n=30)	Student t test	
			t	P
Age (years)	29.0 ± 5.8	29.8 ± 4.4	-0.63	0.53
Gestational age (weeks)	33.8 ± 2.5	33.9 ± 2.4	-0.05	0.96
BMI (Kg/m ²)	26.8 ± 3.9	26.4 ± 4.0	0.42	0.68

Table-2 Comparison between the studied groups regarding the study measurements at baseline and after applying foot massage

	Study Group (n=30)	Control group (n=30)	Student t test	
			t	P
Right ankle at baseline	25.8 ± 2.5	25.7 ± 2.3	0.2	0.83
Right ankle after massage	24.4 ± 2.7	25.9 ± 2.3	-2.3	0.023*
Paired t test	T	3.8	-1.06	
	p	0.0001*	0.29	
Right instep at baseline	24.6 ± 2.5	24.5 ± 2.4	0.1	0.91
Right instep after massage	23.8 ± 2.4	24.5 ± 2.4	-1.0	0.3
Paired t test	T	4.7	33	
	P	0.0001*	0.73	
Right MP joint at baseline	22.7 ± 2.5	22.6 ± 2.3	0.15	0.87
Right MP joint after massage	21.3 ± 2.6	22.6 ± 2.4	-2.0	0.042*
Paired t test	T	15.2	-0.49	
	P	0.0001*	0.62	
Left ankle at baseline	26.0 ± 2.6	25.9 ± 2.4	0.16	0.86
Left ankle after massage	24.2 ± 2.8	25.8 ± 2.3	-2.2	0.028*
Paired t test	T	8.8	1.9	
	P	0.0001*	0.056	
Left MP joint after massage	21.1 ± 2.7	22.4 ± 2.3	-1.86	0.068
Paired t test	T	12.4	0.37	
	P	0.0001*	0.7	
Left instep at baseline	24.1 ± 2.5	24.0 ± 2.4	0.19	0.82
Left instep after massage	22.9 ± 2.5	24.2 ± 2.5	-2.0	0.045*
Paired t test	T	8.2	-1.8	
	P	0.0001*	0.076	
Left MP joint at baseline	22.4 ± 2.4	22.4 ± 2.4	0.05	0.95

* Significant results.

Table-3 Comparison between the studied groups regarding the mean differences between the study measurements at baseline and after massage

	Study Group (n=30)	Control group (n=30)	Student t test	
			t	P
Right ankle	1.46 ± 0.91	-0.2 ± 1.03	6.6	0.0001*
Right instep	0.76 ± 0.87	0.033 ± 0.54	3.8	0.0001*
Right MP joint	1.41 ± 0.5	-0.03 ± 0.36	12.6	0.0001*
Left ankle	1.73 ± 1.07	0.1 ± 0.27	8.07	0.0001*
Left instep	1.25 ± 0.82	-0.2 ± 0.59	7.7	0.0001*
Left MP joint	1.31 ± 0.57	0.05 ± 0.72	7.4	0.0001*

* Significant results

Discussion

Because massage has been shown to be an effective treatment for oedema, stimulating circulation, it is logic that foot massage might show a similar effect on physiological lower leg oedema in late pregnancy⁽¹²⁾

In the present study, after applying foot massage, significant reductions in all the study measurements were found in the experimental group as shown by the paired test comparison. Also, patients in the experimental group had significantly lower levels of most of the study measurements when compared with the control group after implementation of the study intervention. Furthermore, comparison between the mean differences of the study measurements in the studied groups before and after implementing of foot massage had shown that the experimental group had significant differences in all the study

measurements when compared with the control group.

These findings support the effectiveness of foot massage as an intervention to reduce physiological lower leg oedema. Kent et al⁽¹³⁾ and Hartmann and Huch⁽⁵⁾ published similar findings, using different methods. However, Mollart⁽⁴⁾ and Katz et al⁽⁵⁾ did not obtain significant results on physiological lower leg edema in late pregnancy.

From the above findings we may conclude that pain relief is one of the roles of the obstetric nurse which can be fulfilled by simple and effective intervention through foot massage and edematous foot in late pregnancy.

Conclusions

Foot massage is effective in alleviation of lower leg edema in late pregnancy. Hence, foot massage should be recommended for lower leg edema in

late pregnancy as an important issue in

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