



OXYTOCIN RELEASED FROM BACK MASSAGE EXTENDS CONTRACTIONS IN THE FIRST STAGE OF LABOR: EVIDENCE-BASED CASE REPORT (EBCR)

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Abstract

Introduction: Maternal health is a key indicator of community welfare as measured by the Maternal Mortality Rate (MMR). One of the problems with maternal mortality is caused by prolonged labor. Non-pharmacological action in the form of back massage is an important consideration in health services that can be utilized more optimally. This evidence-based case report aims to find out the effectiveness of back massage to increase contractions in the active phase of the first stage of labor.

Method: Article search using Pubmed and Google Scholar databases. Found 2 articles chosen one according to the inclusion and exclusion criteria and has been screened previously, then reviewed critically.

Result: Based on studies by Kursih Sulastriningsih, et al and Adinda Putri Sari Dewi, et al, it was found that back massage is effective in increased contractions in the first stage of labor in the active phase.

Conclusion: Back massage will speed up the work of the parasympathetic nerves in stimulating the posterior pituitary to release oxytocin which can have a relaxing effect. The relaxation experienced by the mother stimulates the brain to reduce levels of the hormone adrenaline and increase the production of oxytocin, which is a factor in producing adequate uterine contractions. Having adequate contractions can cause the cervix to flatten and open. Back massage has been suggested as an effective, inexpensive, non-pharmacological way to induce labor and increase contractions to speed up the progress of labor.

Keywords: Oxytocin, back Massage, contractions, the first stage of labor

INTRODUCTION

Prolonged labor is labor that lasts more than 24 hours for primigravida and/or 18 hours for multigravida. Prolonged labor is a long labor accompanied by maternal and fetal complications(1). Until now, prolonged labor is one of several causes of death for mothers and newborns. On average, prolonged labor in the world causes 8% of maternal deaths, while in Indonesia, based on data from the Indonesian Health Profile, the cause of the highest number of maternal deaths in 2019 is prolonged labor which reached 4.3% of total births. Likewise, in West Java Province, 19.74% of maternal deaths were caused by, among other things, prolonged labor. Bandung City itself, especially Kiaracondong District, is the area with the second largest maternal mortality after Coblong District

according to observations of the distribution of maternal deaths in Bandung City from 2016 to 2020. According to data from the 2017 SDKI (Indonesian Demographic and Health Survey), the number of birth incidents in Indonesia uses the Sectio Caesarea (SC) method as much as 17% of the total number of births in health facilities. This shows that there has been an increase in the number of births via the SC method(2).

Childbirth is a series of processes that end with the mother expelling the products of conception from intrauterine to extrauterine. The initial stage of labor is kala 1, namely the opening and dilatation of the cervix, which consists of a latent phase and an active phase. The latent phase is the start of regular contractions and is followed by cervical dilatation up to 3 cm, while the active phase is the interval after the latent phase which is followed by complete cervical dilatation (10 cm). (3) Based on the Friedman Curve, it is calculated that the opening for primigravida is 1 cm/hour, while the opening for multigravida is 2 cm/hour. Acceleration of the first stage is the main element in the labor process for postpartum mothers. Delay in opening is a threat to the lives of both mother and baby(4)(5).

Normal labor occurs 4-24 hours after uterine contractions occur which cause changes in the cervix. As labor progresses, the contractions become more frequent, longer, and stronger in intensity. Adequate contractions are needed so that labor can proceed normally. In the first stage, the active phase is considered more tiring and painful because uterine activity increases. In this phase there is often an increase in adrenaline production, this hormone can inhibit contractions and slow down labor. Adrenaline which consists of ketocolamine causes an increase in cardiac output and respiratory frequency(6).

In addition, increased adrenaline causes a decrease in blood flow to the uterus and placenta. Research by Simona Labor and Simon Maguire states that lack of blood flow to the placenta causes the fetus to experience hypoxia and fetal metabolic acidosis. Meanwhile, reduced blood flow to the uterus reduces uterine contractions. Reduced uterine contractions will result in changes in the cervix because dilatation and effacement of the cervix will occur if there are adequate contractions. However, not all mothers experience adequate contractions, So action is needed to increase contractions such as back massage(7).

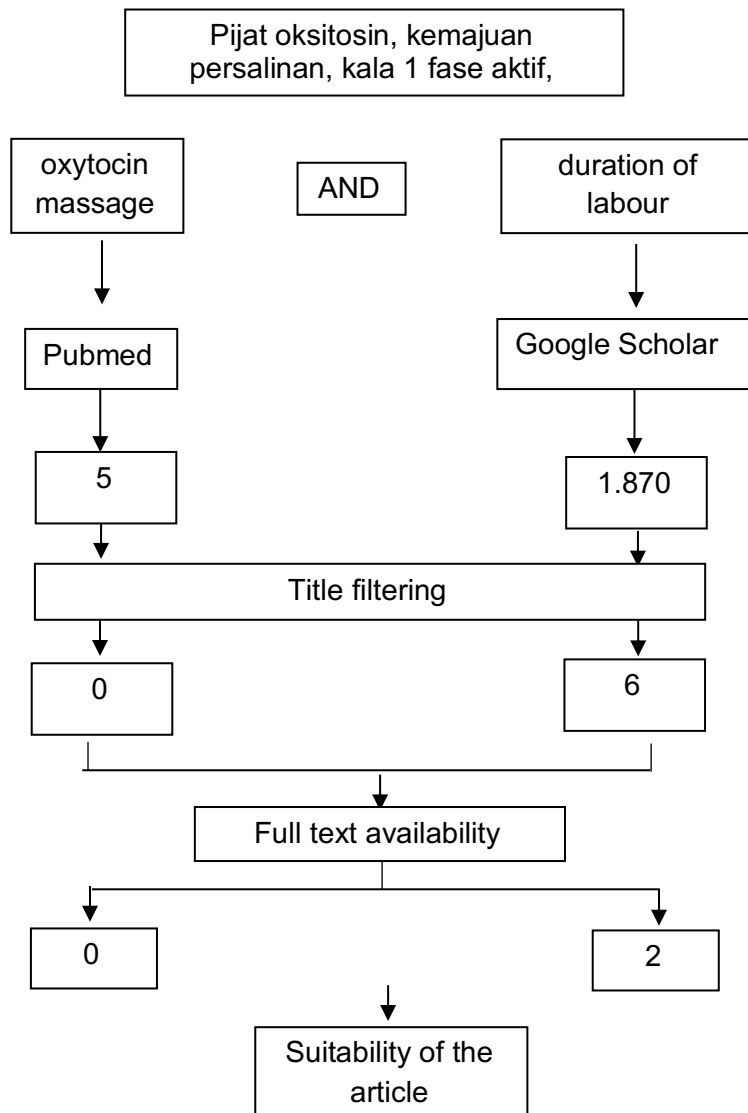
Back massage is one method that can be used to increase uterine contractions. This technique can stimulate the formation of natural oxytocin in the mother's body and channel it to the uterus, causing contractions. With adequate contractions, the cervix can flatten and open. This action can be stopped if the contractions experienced become strong and long. Back massage is a natural induction that can be done to speed up the labor process in a healthy and normal pregnancy.⁷ Every individual has the right to be born in a healthy manner, for the reason every woman of childbearing age, pregnant mother, giving birth and her baby has the right to receive quality services(8).

The purpose of writing this case report is to find out whether back massage is effective in increasing contractions in the active phase of first- stage labor.

METHODS

The literature search procedure to answer the problem above is to search the literature thoroughly *online* using the electronic databases Pubmed and Google Scholar. The keywords used are oxytocin massage, 1st stage active phase, and progress of labor using the inclusion criteria of articles published within the last 5 years (2018-2022), maximum *full text*, *level evidence* minimum 2 articles.

Based on the search method with the criteria above, 5 articles were found on Pubmed and 1,870 articles on Google Scholar. After further selection, there were 2 articles that were considered relevant to the problem.



CASE

A pregnant woman, Mrs. P, aged 21 years G2P1A0, term gestation, came to the Ibrahim Adjie Community Health Center on March 9 2023 at 05.40 WIB complaining of heartburn since 23.00 WIB, there had been no discharge of mucus mixed with blood and amniotic fluid from the mother's birth canal. Fetal movements are still felt by the mother. The objective data results from the examination were blood pressure 110/80 mmHg, pulse 82x/minute, respiration 22x/minute, and temperature 36.70 C. Uterine Fundal Height (TFU) 29 cm, Head presentation 3/5, contractions 3/10'/35", FHR 150 x/minute, regular. Internal examination showed that the vaginal vulva had no abnormalities, the portio was thin and soft, the opening was 5 cm, the amniotic membranes were intact, cephalic presentation, the position of the small fontanel right in front, decreased station -1, molasses 0. The diagnosis of this case was G2P1A0 parturient term stage 1 active phase, single fetus, live, intrauterine, cephalic presentation.

The care provided in this case is observing the progress of labor and the condition of the mother and fetus, meeting nutritional needs, hydration, and providing back massage to release oxytocin.

On March 9, 2023, at 11.25 WIB, the mother complained that her heartburn was getting stronger and more frequent and there was an urge to force her to urinate, as if

she wanted to defecate. Examination was carried out, contractions 4x/10'/45", DJJ 140x/minute, regular. Internal examination results, portio not palpable, complete dilatation, positive amniotic membranes, head presentation, the position of anterior fontanel, decreased station +2, molasses 0. Diagnosis of this case is G2P1A0 parturient term II stage, single fetus, alive, intrauterine, presentation head.

Based on the case above, we formulated a clinical question based on PIO analysis where the Problem (P) is the mother giving birth during the first active phase with back massage as Intervention (I) to increase contractions as Outcome (O). Based on the PIO analysis, the formulation of the problem is "Can back massage increase contractions in pregnant women during the 1st active phase of labor?"

Table 1. summary of critical review

No	Journal	Validity	Importance	Applicability
1	<p><i>Pengaruh Pijat Oksitosin Terhadap Lama Persalinan Kala I Fase Aktif Di Klinik Pim Kota Depok Tahun 2021</i></p> <p>Kursih Sulastriningsih¹, Sitti Saleha² Stikes Bhakti Pertiwi Indonesia¹, Unifersitas Islam Negeri Alauddin Makasar².</p> <p>Jurnal Ilmiah Bidan Vol. 6 No. 1 (2022)</p> <p>Level of evidence: 2</p> <p>Source: Google Scholar</p>	<p>This journal is a type of research with a <i>Quasi-Experimental design</i> using a posttest-only design with control groups carried out between March – April 2021.</p> <p>This study was designed to assess intervention outcomes. The research question focused on the population, namely all mothers giving birth at the PIM Medika Clinic in Depok in 2021, with a total of 48 women giving birth. The intervention given was oxytocin massage, the comparison was for the group that was not given the intervention, and the results were measured by the Bishop score.</p> <p>Sampling was carried out using a purposive sampling technique to obtain a sample size of 30 respondents. for each intervention group and control group of 15 people.</p> <p>There were no dropouts and there were no provisions on inclusion criteria and exclusion criteria in this study.</p> <p>In this study, researchers were not blinded to the research group.</p> <p>Regardless of the experimental intervention, the study groups received the same level of care. The research protocol is clear. No additional interventions were provided. There is no follow-up interval in the study group in this journal</p>	<p>Results are expressed by showing the average score, standard deviation, and p-value. There were quite significant differences in both the intervention group and the control group. The difference between the two groups in terms of mean duration of labor was found to be statistically significant (p < 0.05).</p> <p>The calculation results obtained by the difference in the mean value (average) in the length of labor in the first stage of the active phase in the intervention group (oxytocin massage) were 5.533 and the mean value (average) in the length of labor in the first stage in the active phase in the control group was 9.867.</p> <p>There were no dropouts in this study. Potential sources of bias</p>	<p>Oxytocin massage is effective in reducing the induction of elective labor. The benefits of this intervention outweigh the disadvantages and do not necessarily have a cost.</p> <p>This method can speed up the progress of labor.</p>

			<p>were not identified. The statistical test used is the Mann-Whitney test which has a known significance value of $0.000 < 0.05$, so it can be concluded that there is an effect of oxytocin massage on the length of the first stage of labor active phase at the PIM Clinic in 2021.</p> <p>In this journal, the precision of estimates of intervention or treatment effects is not reported. Confidence intervals were not reported.</p>
2	<p><i>Pengaruh Pijat Oksitosin Terhadap Lama Kala I Persalinan</i></p> <p>Lailatul Mustaghfiroh, Naomi Parmila Hesti. <i>urnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal. 2022</i></p> <p>Source: Google Scholar</p>	<p>This research uses a <i>cross-sectional design</i> which was carried out for 1 month in June 2021. 46 women gave birth normally with their amniotic skin still intact at PMB Kasmanita Kudus.</p> <p>With the inclusion criteria, mothers give birth normally with intact amniotic skin.</p> <p>In this study, the instrument used by the researcher was an observation sheet seen from the medical record. The type of data in this research is secondary data obtained or collected through medical records. The data analysis technique used is univariate analysis with percentages and is presented in the form of a frequency distribution table ..</p>	<p>Of the 46 respondents, the duration of labor in the first stage of the active phase in postpartum mothers who received oxytocin massage was found to be faster than the theory for the majority of 29 respondents (63%).</p> <p>This shows that the duration of the first stage of labor in mothers who received oxytocin massage was faster.</p> <p>There is an influence of oxytocin massage on the progress of labor in women giving birth. Practice areas can apply oxytocin massage to produce progress in labor because it can influence.</p>

RESULTS AND DISCUSSION

The results of the first journal review based on the results of research conducted at the Pim Clinic Depok in 2021 showed that the results of the Mann-Whitney test showed a significance value of $0.000 < 0.05$. This means that $0.000 < 0.05$ means there is a significant difference between the length of labor in the 1st active phase of the experimental group who were given back massage and the control group who were not given treatment. There is a difference in the length of labor in the first stage of the active

phase at the PIM Depok Clinic. It is recommended that the service implement a non-pharmacological method of increasing contractions to progress labor, namely back massage.

The results of the second journal review based on research conducted at PMB Kasmanita Kudus in 2021, showed that there was a significant difference in the average length of labor between mothers who received back massage and mothers who did not receive back massage, with the results being an average of hours quicker in the intervention group compared to the control group. The difference in hours between the intervention group and the control group was 1.1 hours. In the experimental group with long oxytocin massage treatment in the first phase, the active phase was a minimum of 1.5 hours and a maximum of 4 hours with an average of 2.65 hours. In the control group without treatment, the duration of the first active phase was a minimum of 4 hours and a maximum of 6 hours with an average of 3.75 hours.

Back massage is a massage of the spine starting from the 5-6th rib to the scapula which will speed up the work of the parasympathetic nerves by stimulating the posterior pituitary to release oxytocin which can have a relaxing effect. The relaxation experienced by the mother stimulates the brain to reduce levels of the hormone adrenaline and increase the production of oxytocin which is a factor in producing adequate uterine contractions(9). Apart from that, relaxation also aims to reduce the levels of epinephrine and non-epinephrine in the blood so that there is balance (equilibrium). On the other hand, massage on the back can stimulate the release of endorphin hormones, while endorphins can function as ejectors and a feeling of relaxation can create calm, thus reducing tension. muscle(10).

In research, Morhenn et al (2012) explained that there was a relationship between spinal muscle massage and increasing oxytocin levels and reducing levels of adrenocorticotropin hormone (ACTH), nitric oxide (NO), and beta-endorphin (BE). Uterine contractions occur due to stimulation of the smooth muscle of the uterus and a decrease in the hormone progesterone which causes the release of the hormone oxytocin. The stimulus that triggers most smooth muscle contractions is an increase in intracellular calcium ions. This increase can be elicited in different types of smooth muscle by nerve stimulation of the smooth muscle fiber, hormonal stimulation, stretch of the fiber, or even changes in the chemical environment of the fiber(11).

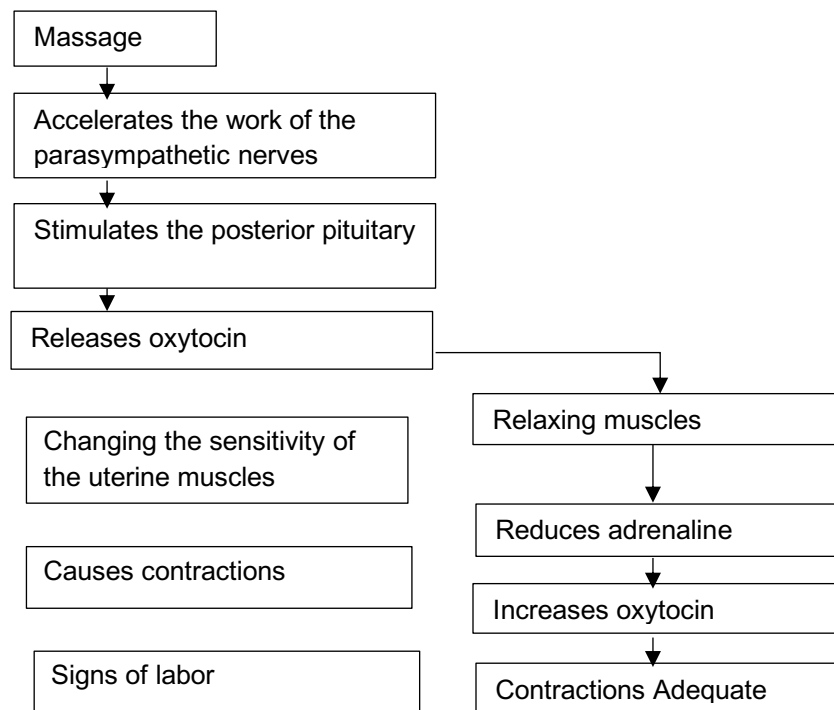
Apart from that, doing a back massage can improve blood circulation and stretch the muscles so that the pain experienced during the birth process will decrease. Having adequate contractions can cause the cervix to flatten and open. This action can be stopped if the contractions experienced become strong and long. Back massage has been suggested as an effective, inexpensive, non-pharmacological way to induce labor and speed up labor progress.

According to Jamir (2021), back massage is the strong pressure of the fingers or index finger on certain points or the body's natural pressure to induce or facilitate labor, right in the area that stores most of the energy. This method works because it presses certain points on the body which can increase blood flow stimulate the uterus and cause contractions, making the birthing process easier. This back massage can be of maximum benefit for inducing labor, only when the cervix is ripe and the body is ready to give birth(12).

Mothers in labor receive back massage in the hope of reducing the risk of prolonged labor, complications, and bleeding as well as helping to maintain the oxygen supply to the baby during the birthing process.12 Oxytocin itself is a hormone that can increase the influx of calcium ions into intracellular cells. The release of the hormone oxytocin will strengthen the bonds of actin and myosin so that uterine contractions will be stronger. In this case, according to the theory, back massage given to mothers during birth can increase uterine contractions(13).

Based on the articles of Kursih Sulastriningsih et al in 2022 and Lailatul Mustaghfiroh et al in 2022, results were found that support back massage for the progress of labor in women giving birth. In the first article, it was found that back massage was proven to help shorten the labor process. This is in line with the results of research conducted by Kursih Sulastriningsih et al in 2022 where there was a significant increase in the group that received back massage compared to the group that was not given the intervention. The research results of Lailatul Mustaghfiroh et al.'s 2022 article show that back massage can speed up the labor process in mothers in the first stage of labor(14)(15).

Evaluation of the results of the back massage intervention, there was faster progress in labor, wherein the intervention was carried out by the author at 09.30 with the results of cervical dilatation of 5 cm, contractions of 3x/10'/35" indicating that he was in the active phase of labor, then midwifery care was carried out with giving a back massage carried out by the author, the results showed that labor was progressing at 11.25 WIB. The mother complained that the heartburn was getting stronger and longer and there was an urge to push, feeling water coming out spontaneously from the birth canal. Then an internal examination was carried out and the results were cervical dilatation of 10 cm. This is in accordance with research conducted by Lailatul (2022) in the intervention group with a long back massage treatment in the first active phase for a minimum of 1.5 hours and a maximum of 4 hours with an average of 2.65 hours. In the control group without treatment, the duration of the first active phase was a minimum of 4 hours and a maximum of 6 hours with an average of 3.75 hours. Without a back massage, uterine contractions occur naturally. If it is not supported by physical factors and psychological conditions, uterine contractions will be inadequate. Recommendations during labor such as eating, drinking, mobilizing, positioning and deep breathing need to be carried out by the birthing mother so that they can support the work of the uterus. Another effort that can be made by the family is to provide support by accompanying and meeting the mother's needs during childbirth. Apart from that, midwives also need to provide support by providing childbirth care that is appropriate to the mother's condition so that uterine contractions can increase.



The oxytocin mechanism increases contractions

CONCLUSION

Applying back massage can stimulate the production of oxytocin and have an impact on increasing contractions and the progress of labor during the first stage of the active phase. This intervention is recommended in cases of normal labor and labor with slow labor progress.

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