

Review of the medicinal herbs effective on labor and cesarean section pain in Iran

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ABSTRACT

The number of women who give birth to their child via cesarean section is increasing in both developed and developing countries. This study was aimed to review the medicinal herbs effective in relieving labor and cesarean section pain. In this study the terms *medicinal herbs*, *extract*, *essence*, *labor*, and *pain* were searched in citation databases including Institute for Scientific Information, PubMed, Scopus, Google Scholar, Scientific Information Database, Magiran, etc. Seven medicinal herbs were found to be used for relieving the pain due to normal labor, cesarean section, and labor-related pains. *Mentha piperita*, *Matricaria recutita*, *Cuminum cyminum*, *Hypericum calycinum*, *Lavandula stoechas* L, and *Ananas comosus* were the plants effective in relieving the pain due to normal delivery or cesarean section. Bioactive and active compounds and herbal antioxidants in these plants are likely to exert anti-inflammatory and analgesic properties. This review article indicated that medicinal herbs in various forms such as extract and essence have been demonstrated to effectively relieve the pain of labor and cesarean section in most clinical trials. Overall, further pharmacological and toxicological investigations, however, are needed to detect other properties and potential side effects of these plants.

KEY WORDS: Medicinal herbs, Essence, Extract, Labor, Pain.

1. INTRODUCTION

In recent decades, the rate of cesarean sections has been increasing worldwide. The number of women who give birth to their child via cesarean section is increasing in both developed and developing countries (Najmi and Rehan, 2000). Normal labour is mostly considered as the best choice of delivery, and cesarean section is limited to cases when delivery through normal channels is not possible or could lead to the risks to the fetus or mother. Moreover vaginal delivery results in decreased hospitalizations in neonatal intensive care units and need for neonatal oxygen (David and Norman, 2000). Cesarean section is one of the most common major surgeries in obstetrics (Carson and David, 1997). After any surgeries, the patients inevitably experience pain at various degrees. Following cesarean section, the patients experience acute pain due to visceral reaction and uterine contractions (Donald, 2001; Gray, 2001).

Cesarean sections without indication could be associated with numerous complications in mothers and fetuses. For example, hemorrhage, anesthesia-related complications, embolism, scar infection, pelvic infection, respiratory infection, urinary tract infection, and venous thrombosis as well as psychological complications such as anger, anxiety, feelings of guilty, and disappointment are five times higher, and mortality is seven times higher in the women undergoing cesarean sections than those with normal delivery. These complications collectively could cause five-fold increase in delivery-associated costs for mothers and families (Shorten, 2004).

Despite many efforts made by pain societies to relieve postoperative acute pain, management of pain remains a significant clinical issue. Different studies have demonstrated several adverse effects of failure to relieve pain with maximum physiological contribution to the body systems, including Sympathetic adrenal function, anemia, coronary artery disease, blood clots in deep veins, insufficient depth of respiration, atelectasis, increased heart rate, increased blood pressure, etc. (Geerts, 2001; Saper Habib, Anez Simon, 2006; 2002).

Opioids are used as first-line treatment for pain after surgery, including Cesarean section, but researchers are seeking to replace opioids with non-steroidal anti-inflammatory drugs *and* prostaglandin antagonists due to respiratory depression, drowsiness, and drug dependency (Daniel, 2002).

Traditional treatments have recommended herbal medicines to relieve the pain due to delivery (Bahmani, 2014; Bahmani, 2015; Delfan, 2014; Bahmani, 2014; Asadi-samai, 2014; Bahmani, 2014; Delfan, 2014; Bahmani, 2014; Saki, 2014; Bahmani, 2014). This study is aimed to review the medicinal herbs effective in relieving the pain due to labor and cesarean section.

2. MATERIALS AND METHODS

In this study the terms medicinal herbs, extract, essence, labor, and pain were searched in citation databases including Institute for Scientific Information, PubMed, Scopus, Google Scholar, Scientific Information Database, Magiran, etc.

3. RESULTS

Seven medicinal herbs have been found to be used for relieving the pain due to normal labor, cesarean section, and labor-related pains. *Mentha piperita*, *Matricaria recutita*, *Cuminum cyminum*, *Hypericum hookerianum*, *Lavandula officinalis*, *Cucuma longa*, and *Ananas comosus* were the plants effective in relieving the pain due to normal delivery or cesarean section. Table presents further details.

Table.1.Medicinal herbs effective in relieving pain due to labor and cesarean section

| Common name | Binomial name | Property |
|------------------|------------------------------|---|
| Peppermint | <i>Mentha piperita</i> | Forty drops of <i>M. piperita</i> taken orally three times 20 minutes after discontinuation of serum were effective on relieving the pain and bloat at second and third 20 minutes and 120 minutes after cesarean section (Fazel, 2003). |
| German chamomile | <i>Matricaria recutita</i> | <i>M. recutita</i> bathing twice a day for 14 days was used to relieve the pain after episiotomy and compared with placebo. The findings indicated that the decrease in intensity and duration of the pain after episiotomy was seen at the first hour and the seventh and 14th days after normal delivery (Pazandeh, 2010) |
| Cumin | <i>Cuminum cyminum</i> | The patients undergoing cesarean section were orally administered with 40 drops of <i>C. cyminum</i> per 20 minutes within three doses and the results were compared with placebo. The results demonstrated that <i>C. cyminum</i> essence strongly affected postoperative pain (Fazel and Esmaeeli, 2010). |
| Lavendar | <i>Lavandula officinalis</i> | Inhalation of <i>L. officinalis</i> essence was compared with <i>L. officinalis</i> perfume (with no relieving effect) at 3, 6, and 12 h after cesarean section. The comparison indicated that the essence contributed to declining postoperative pain intensity. |
| Hypericum | <i>Hypericum hookerianum</i> | In a study <i>H. hookerianum</i> ointment was used to heal cesarean section and compared with placebo and negative controls. On the 40th postoperative day, relief of pain was significantly different between the treatment group and placebo group as well as the treatment group and negative controls (Maheshwari, 2006). |
| Turmeric | <i>Curcuma longa</i> | <i>C. longa</i> (topical) solution was used daily to heal episiotomy incision site till 10 days in comparison with bethadine solution. On the 10th postoperative day, a significant relief of pain was noted (Pulok and Suresh, 2000). |
| Pineapple | <i>Ananas comosus</i> | Three 100 mg bromelain (active compound of <i>A. comosus</i>) oral tablet taken daily for six post-delivery days was investigated in comparison with placebo and episiotomy decreased significantly on the first and third days after delivery (Golezar and Abaspoor, 2009) |

4. DISCUSSION

Since ancient times plants have been used to prevent and treat many diseases (Asadbeygi, 2014; Karamati, 2014; Bahmani, 2014; Delfan, 2014; Saki, 2014). Pure compounds, which paved a long way for modern pharmacology, took a long time, but many compounds have been recently discovered isolated from medicinal plants (Bahmani, 2014; Gholami-Ahangaran, 2012; Bahmani, 2014; Sarrafchi, 2015; Bahmani, 2015).

In this review article, seven medicinal herbs were found to be used for relieving the pain due to normal labor, cesarean section, and labor-related pains, *M. piperita*, *M. recutita*, *C. cyminum*, *H. hookerianum*, *L. officinalis*, *C. longa*, and *A. comosus* were the plants working against the pain due to normal delivery or cesarean section.

Study findings have indicated that *M. piperita* contains some compounds such as menthol, menton, and menthyl acetate (Aynechi, 1995). *M. piperita* essence contributes to treating abdominal cramps (Liu, 1997) and inhibition of colonic spasm (King Ham, 1995). *M. recutita* is a pain-relieving and menstrual pain-soothing agent (Zargari, 1996). The main component of *C. cyminum* essence is *cuminic aldehyde and cuminol*. *Furthermore some compounds are found in C. cyminum* in small amounts, including cymin, felandrone, carron, and cuminic alcohol (Zargari, 1996). *L. officinalis* essence contains analgesic called linalyl acetate (Ebrahimi adib). *H. hookerianum* causes the inhibition of cyclooxygenase, synthesis of prostaglandins, and inhibition of leukotriene B4 and arachidonic acid A, and exerts analgesic and anti-inflammatory effects (Kundus, 2005). *C. longa* contains

curcuminoid compounds such as curcumin (Golmakani and Rabiee Motlagh). *C. longa* and curcumin exert anti-inflammatory and wound healing properties.

A. comosus contains *phytonutrients*, vitamin C, and a compound called bromelain as well as a variety of compounds such as proteolytic methyl enzymes such as protease, phosphatase, peroxidase, cellulase, glycoproteinase, and carbohydrates (Samadi and Khadivzadeh, 2009). Oral bromelain causes reduction in levels of plasma bradykinin, prostaglandin E2, and thromboxan B2 in inflamed areas (Maurer, 2001), and ultimately relieves pain through decreasing pain mediators in the inflamed area and reducing inflammatory topical prostaglandins (Zatuchni and Colombi, 1967).

Bioactive and active compounds and herbal antioxidants in these plants are likely to exert anti-inflammatory and analgesic properties. This review article indicated that medicinal herbs in various forms such as extract and essence have been demonstrated to effectively relieve the pain of labor and cesarean section in most clinical trials. Overall, further pharmacological and toxicological investigations, however, are needed to detect other properties and potential side effects of these plants.

REFERENCES

- Anez Simon C, Rull Bartomeu M, Rodriguez Perez A and Fuentes Baens A, Intranasal opioids for acute pain, *Rev Esp Anesthesiol Reanim*, 53(10), 2006, 520-643.
- Asadbeigi M, Mohammadi T, Rafieian-Kopaei M, Saki K, Bahmani M, Delfan B, Traditional effects of medicinal plants in the treatment of respiratory diseases and disorders: an ethnobotanical study in the Urmia, *Asian Pac J Trop Med.*, 7(1), 2014, S364-S368.
- Asadi-Samani M, Bahmani M, Rafieian-Kopaei M, The chemical composition, botanical characteristic and biological activities of *Borago officinalis*: a review, *Asian Pac J Trop Med.*, 7(1), 2014, 22-28.
- Aynechi Y, Seed and Medicinal Plants, 2nd ed., Publishing in Tehran University, 1995, 35.
- Bahmani M, Banihabib EKH M, Rafieian-Kopaei M and Gholami-Ahangaran M, Comparison of Disinfection Activities of Nicotine with Copper Sulphate in water Containing *Limnatis nilotica*, *Kafkas Univ Vet Fak Derg.*, 21 (1), 2015, 9-11.
- Bahmani M, Karamati SA, Hassanzadazar H, Forouzan SH, Rafieian-Kopaei M, Kazemi-Ghoshchi B, Asadzadeh J, Kheiri AGh, Ehsan Bahmani E, Ethnobotanic study of medicinal plants in Urmia city: identification and traditional using of antiparasites plants, *Asian Pac J Trop Dis.*, 4(2), 2014, 906-910.
- Bahmani M, Rafieian M, Baradaran A, Rafieian S, Rafieian-kopaei M, Nephrotoxicity and hepatotoxicity evaluation of *Crocus sativus* stigmas in neonates of nursing mice, *J Nephropathol.*, 3(2), 2014, 81-85.
- Bahmani M, Rafieian-Kopaei M, Hassanzadazar H, Saki K, Karamati SA, Delfan B, A review on most important herbal and synthetic antihelmintic drugs, *Asian Pac J Trop Med.*, 7(1), 2014, 29-33.
- Bahmani M, Rafieian-Kopaei M, Jeloudari M, Eftekhari Z, Delfan B, Zargar A, Forouzan SH, A review of the health effects and uses of drugs of plant *licorice* (*Glycyrrhiza glabra* L.) in Iran, *Asian Pac J Trop Dis.*, 4(2), 2014, 847-849.
- Bahmani M, Saki K, Rafieian-Kopaei M, Karamati SA, Eftekhari Z, Jelodari M, The most common herbal medicines affecting *Sarcomastigophora* branches: a review study, *Asian Pac J Trop Med.*, 7(1), 2014, 14-21.
- Bahmani M, Sarrafchi A, Shirzad H, Rafieian-Kopaei M, *Curr Pharm Des.*, 2015 Nov 12, [Epub ahead of print].
- Bahmani M, Shirzad HA, Majlesi M, Shahinfard N, Rafieian-Kopaei M, A review study on analgesic applications of Iranian medicinal plants, *Asian Pac J Trop Med.*, 7(1), 2014, 43-53.
- Bahmani M, Zargar A, Rafieian-Kopaei M, Saki M, Ethnobotanical study of medicinal plants used in the management of diabetes mellitus in the Urmia, Northwest Iran, *Asian Pac J Trop Med.*, 7(1), 2014, 348-354.
- Bahmani M, Zargar A, Rafieian-Kopaei M, Identification of medicinal plants of Urmia for treatment of gastrointestinal disorders, *Rev Bras Farmacogn.*, 24(4), 2014, 468-480.
- Carson DL, David WM, Preoperative and postoperative management, In: Michael JZ, Seymour IS, Harrold E, Maingot's Abdominal Operations, 10th ed., London: Prentice Hall International Inc., 1997, 474-80.
- Daniel LC, Angeles A, Preoperative evaluation and postoperative management, In: Jonathan SB, Novak's Gynecology, 13th ed., Philadelphia: Williams & Wilkins, 2002, 584-7.
- David H, Norman J, Gynecology Illustrated, 5th ed., London: Churchill Livingstone, 2000, 301-38.
- Delfan B, Bahmani M, Eftekhari Z, Jelodari M, Saki K, Mohammadi T, Effective herbs on the wound and skin disorders: a ethnobotanical study in Lorestan province, west of Iran, *Asian Pac J Trop Dis.*, 4(2), 2014, 938-942.
- Delfan B, Bahmani M, Hassanzadazar H, Saki K, Rafieian-Kopaei M, Identification of medicinal plants affecting on headaches and migraines in Lorestan Province, West of Iran, *Asian Pac J Trop Med.*, 7(1), 2014, 376-379.

- Delfan B, Bahmani M, Rafieian-Kopaei M, Delfan M, Saki K, A review study on ethnobotanical study of medicinal plants used in relief of toothache in Lorestan Province, Iran, *Asian Pac J Trop Dis.*, 4(2), 2014, 879-884.
- Donald GP, NSAID Drugs, In: Bertram GK, Way WL, Howard L, fields Basic & Clinical Pharmacology, 8th ed., Texas, McGraw-Hill, 2001, 512- 22.
- Fazel N and Esmaeeli H, Effect of *Caminum cyminum* on pain severity after cesarean, *Journal of Iran Obstetrics & Gynecology & Infertily*, 11 (4), 2010, 23 - 9.
- Fazel N, Tafazoli M, Ramezni M and Esmaeeli H, Effect of supermint on the irritable bowie syndrome after cesarean section, *Journal of Ardabil Medical University*, 4 (14), 2003, 41 - 6.
- Geerts WH, Heit JA, Clagett GP, Prevention of venous thromboembolism, *Chest*, 119(1), 2001, 132S-175S.
- Gholami-Ahangaran M, Bahmani M, Zia-Jahromi N, Comparative and evaluation of anti-leech (*Limnatis Nilotica*) effect of Olive (*Olea Europaea* L.) with levamisole and tiabendazole, *Asian Pac J Trop Dis.*, 2(1), 2012, 101-103.
- Golezar S and Abaspoor Z, Effect of oral borraelain on pain severity after episiotomy on primiparoug women, The master degree thesis, Ahvaz medical university, 2009.
- Gray FC, Norman FG, Kenneth JL, Williams's obstetrics, 2l st ed., Texas: McGraw- Hill, 2001, 537- 8.
- Habib KB, Gold PW, Chrosus GP, Neuroendocrinology of Stress, *Endocrinol Metab Clin North Am.*, 30(3), 2001, 695-728.
- Karamati SA, Hassanzadazar H, Bahmani M, Rafieian-Kopaei M, Herbal and chemical drugs effective on malaria, *Asian Pac J Trop Dis.*, 4(2), 2014, 599-601.
- King Ham JG, Peppermint oil and colon spasm, *Lancet*, 346 (891), 1995, 986.
- Kundus B, Biswas TK, Das P and Kumar S, Turmeric (*Curcuma longa*) rhizome paste and honey show similar wound healing potential: a preclinical study in rabbits, *Lower Extremity Wounds*, 4 (4), 2005, 205 - 13.
- Lavangna Silvio M, Secci D and Chimenti P, Efficacy of hypericum and calendula oils in the epithelial reconstruction of surgical wounds in child birth with cesarean section, *I. I. Farmaco*, 56 (5 - 7), 2001, 451- 3.
- Liu JH, Chen GH, Veh HZ, Huang CK and Poon SK, Enteric coated peppermint oil capsule in the treatment of irritable bowel syndrome a prospective randomized trial, *J. Gastro Entrol.*, 32 (6), 1997, 765 – 8.
- Maheshwari RR, Singh AK, Gaddipati J and Srimal RC, Multiple biological activities of cur cumin: short review, *Life Sci.*, 78, 2006, 2081.
- Maurer HR, Bromelain: biochemistry, Pharmacology and Medical Use, *Cell Mol. Life Sci.*, 58, 2001, 1238.
- Najmi RS, Rehan N, Prevalence and determinants of caesarean section in a teaching hospital of Pakistan, *J Obstet Gynaecol.*, 20(5), 2000, 479-83.
- Pazandeh F, Savad Zadeh Sh, Mojab F and Alavimajd H, Effect of aroma therapy with chamomile on episiotomy pain, *Journal of Nursing and Midwifery*, 8(4), 2010, 364 - 70.
- Pulok K and Suresh B, The Evaluation of wound healing potential of *hypericum hookerianum* leaf and stem extracts, *J. Complement Med.*, 6 (1), 2000, 61 - 9.
- Saki K, Bahmani M, Rafieian-Kopaei M, Hassanzadazar H, Dehghan K, Bahmani F, Asadzadeh J, The most common native medicinal plants used for psychiatric and neurological disorders in Urmia city, northwest of Iran, *Asian Pac J Trop Dis.*, 4(2), 2014, 895-901.
- Saki K, Bahmani M, Rafieian-Kopaei M, The effect of most important medicinal plants on two important psychiatric disorders (anxiety and depression)-a review, *Asian Pac J Trop Med.*, 7(1), 2014, 34-42.
- Samadi S and Khadivzadeh T, Effect of *hypericum hookerianum* ointment on pain severity after cesarean, *J. Mashhad Med. University*, 9 (2), 2009, 89 - 94.
- Saper CB, The central autonomic nervous system: Conscious visceral perception and autonomic pattern generation, *Ann Rev Neurosci.*, 25, 2002, 433-69.
- Sarrafschi A, Bahmani B, Shirzad H, Rafieian-Kopaei M, *Curr Pharm Des.*, 2015 Nov 12, [Epub ahead of print].
- Shorten A, Chamberlain M, Shorten B, Kariminia A, Making choices for childbirth: development and testing of a decision-aid for women who have experienced previous caesarean, *Patient Educ Couns.*, 52(3), 2014, 307-13.
- Zargari A, *Medicine Plants*, 3Th ed., Institute of publishing and printing of Tehran, 1996, 89.
- Zargari A, *Medicine Plants*, 5Th ed., Tehran University, Tehran, 1996, 73.
- Zatuchni Gerald J and Colombi Daniel J, Bromelains therapy for the prevention of episiotomy pain, *Obstet Gynecol.*, 29, 1967, 275.