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Invasive Medical Intervention Compared with Conservative Intervention in the Treatment of Varicose Veins in Pregnant Women: Rapid Evaluation of the Evidence

Pilar Cardenas Sánchez[1], Jennifer González Bermúdez[2]

1. Enfermera, Máster en Ginecología, Obstetricia y Perinatología, Docente de la Universidad de Costa Rica, Costa Rica.
2. Enfermera, Máster en Ginecología, Obstetricia y Perinatología, Trabajo independiente, Costa Rica.

Abstract: The objective of this study was to analyze the best available scientific evidence related to conservative medical intervention compared with more invasive interventions, including surgery, for the treatment of varicose veins in the lower extremities during pregnancy and the prevention of subsequent onset. The study began with the application of the rapid evidence assessment methodology. A literature search was conducted in databases with no date limits. Inclusion criteria: Pregnant women with varicose veins in the lower extremities of any age. The types of studies analyzed were Systematic Reviews, RCTs, Meta-analyses, or Clinical Practice Guidelines in English, Portuguese, or Spanish. The FLC 2.0 and Agree II platforms were used for analysis, and the Sackett template was used for the interpretation of levels of evidence and grades of recommendation. Three articles were retrieved, and three were selected. It was determined that the recommended intervention is conservative therapy; only in exceptional cases will another intervention be determined. Invasive treatment, including surgery, is reserved for delicate cases, since the risks outweigh the benefits. It is concluded that the first-line treatment for varicose veins in pregnant women is compression stockings. Rutosides and oral anticoagulants appear to be helpful, but they are not safe to use during pregnancy.

Key words: pregnancy; varicose-veins; conservative-treatment; pharmacological-treatment

1. Introduction

Scientific evidence indicates that pregnancy is accompanied by multiple hormonal and physiological changes. These changes, combined with hemostatic changes, can trigger health problems or discomfort during pregnancy. Within this context, an example of this problem is the prevalence and incidence of varicose veins during pregnancy, which can lead to other complications. Approximately 70-80% of pregnant women are at high risk of developing varicose veins, which can begin in the first trimester of pregnancy, accompanied by uncomfortable symptoms, risk factors and impaired quality of life.

In 2001, Cossart [1] conducted a study entitled "Varicose Veins and Pregnancy." The author notes that this health problem is common during this period. He also mentions that minimal venous dilation leads to a focus on conservative treatment; however, if more dilated veins are present, more interventional treatment should be used.

That same year, Thaler, Huch, and Huch [2] conducted a study at the University Hospital of Zurich, Switzerland, where they determined that sufficiently compressive stockings (greater than 32 mmHg) improve venous return in the legs during pregnancy and, therefore, can prevent thrombosis in high-risk patients and improve symptoms.

In 2006, Bamigboye and Hofmeyr [3] published a study concluding that rutosides appear to alleviate the symptoms of venous insufficiency and advanced pregnancies; however, it is not known whether this drug is safe during pregnancy. On the other hand, they stated that external pneumatic compression reduces symptoms but not varicose veins.

In 2009, Lenkovic, Cabrijan, Gruber, et al. conducted a study on the contribution of progesterone to the development of varicose veins in the lower extremities during pregnancy. They demonstrated that the average progesterone concentration in the study group with dilated veins was higher than in the control group. These findings support the role of hormonal factors in the development of varicose veins in women.

On the other hand, in 2014, Sell, Vikatmaa, Albäck, Lepäntalo, et al. conducted a study on compression therapy versus surgery, concluding that surgical elimination of uncomplicated superficial venous reflux is an effective treatment compared to compression stockings alone.

Regarding the topic of the research, it is important to mention that varicose veins occur very frequently in pregnant women. According to statistics, this manifestation affects between 20% of primiparous women, 30% of secundiparous women, and up to 57% of multiparous women.

On an economic level, Vandy et al. [7] and Zhang et al. [8] point out that this condition, associated with the presence of venous ulcers, exceeds US$1 billion in annual expenditures in the United States. These economic losses also impact employment when they incur disability. According to Jundt, Liem, and Moneta, [9] 100% of people with chronic venous insufficiency experience a negative impact on their work, estimated at two million lost work days per year for the country. On the other hand, Lohr et al. [6] mention that as the venous disease progresses, the amount of care required and costs increase.

Among the symptoms reported by pregnant women are pain, a feeling of heaviness in the lower limbs, itching, swelling, cramps, tingling, changes in skin color, and edema, among others. [6, 7, 10] Reported risk factors for varicose vein development include pregnancy, number of pregnancies, age, obesity, prolonged periods in the same position, and female sex. [6, 11-14] Based on this context, it is important for patients to be educated about lifestyle changes and the different treatment options available to them, [6] whether pharmacological, non-pharmacological, or surgical.

This is why obstetrics and gynecology professionals must be aware of and scientifically understand the different treatment options available for people with this condition. Therefore, the objective of this study was to analyze the best available scientific evidence related to conservative medical intervention compared to more invasive interventions, including surgery, for the treatment of varicose veins in the lower extremities during pregnancy and the prevention of their subsequent onset.

This research has implications for prenatal and postnatal obstetric nursing practice, as it contributes to an updated practice based on the best available scientific evidence for qualified decision-making in the care of pregnant women.

2. Materials and Methods

This study is a secondary applied research project, understood as the use of knowledge in practice to enrich the discipline [15], followed by the implementation and systematization of research-based practice [16].

Currently, Evidence-Based Nursing can be considered a strategy where research supports changes in thinking and practices within the discipline, using the best scientific evidence [17, 18]. Secondary studies provide significant support, as they stem from a previous study, which conducts exhaustive reviews of other research [19], transforming it into a reliable

tool for the application of Evidence-Based Nursing Practice. The methodological aspects that guided this study are presented below, and it consists of five steps or phases.

(1) Phase 0: Spirit of inquiry

This corresponds to the emergence of a concern that leads to questioning the reasons for the care provided to users in their current reality. In this study, concern arose from observing a lack of knowledge and consulting with obstetric and gynecology nursing professionals about the unscientific approach to the care, treatment, and prevention of varicose veins in pregnant women.

(2) Phase 1: Formulation of the clinical question

The clinical question requires a systematic approach to be answered, which is why the acronym PICO (population, intervention, comparison, and outcomes) is used. In this study, the question posed is: In pregnant women, is conservative medical intervention more effective than invasive intervention, including surgery, for the treatment and prevention of the subsequent development of varicose veins in the lower extremities? Once the type of research question was established, the most suitable types of studies that answered the question were determined: randomized controlled clinical trials (RCTs), systematic reviews, meta-analyses, and clinical practice guidelines.

(3) Phase 2: Search for scientific evidence

To develop this step, a line of work was established through: search strategy and establishment of the PICO question.

Table 1. Description of the clinical question according to the PICO acronym

P	I	C	O
Problem of interest	Intervention to be considered	Intervention to be compared	Clinical outcome being assessed
Pregnant women with varicose veins	Conservative medical treatment for varicose veins in the lower extremities	Invasive medical treatment, including surgery, for the treatment of varicose veins in MI	Effectiveness of treatment and prevention of varicose veins in MI and subsequent onset.

Source: Prepared by the authors.

Strategic map:

- Determination of specific descriptors: These were established based on the clinical question in Spanish, English, and Portuguese: Pregnancy, Varicose Veins, Treatment, Lower Extremities, Pharmacological Treatment, Conservative Treatment, and Surgical Treatment.
- Relationship between formulated concepts: Pregnancy with varicose veins, varicose veins in the lower extremities, treatment for varicose veins, lower extremities with treatment for varicose veins, pharmacological treatment for varicose veins, conservative treatment for varicose veins, surgical treatment for varicose veins.
- Descriptor translation: Most of the high-quality scientific evidence is available in English and Portuguese; therefore, descriptor translation is necessary to obtain the evidence in the databases.
- Inclusion criteria for evidence retrieval (Table 2)

Table 2. Description of inclusion criteria, 2017

Inclusion criteria	
Time	There was no time restriction; the search included articles from 1939 to 2017.
Population	Pregnant women with varicose vein disease.
Type of study	Systematic Reviews, Clinical Practice Guidelines, RCTs, and Meta-analyses.
Language	Publications in Spanish, English, and Portuguese.

Source: Prepared by the authors

Search sites used for the study: PubMed, Science Direct, Cochrane Library, SciELo, and Google Scholar.

Establishment of the search algorithm: It is designed to locate an element with certain properties within a structure or database. The search algorithm results in a number of articles that must subsequently be critically read. (Figure 1)

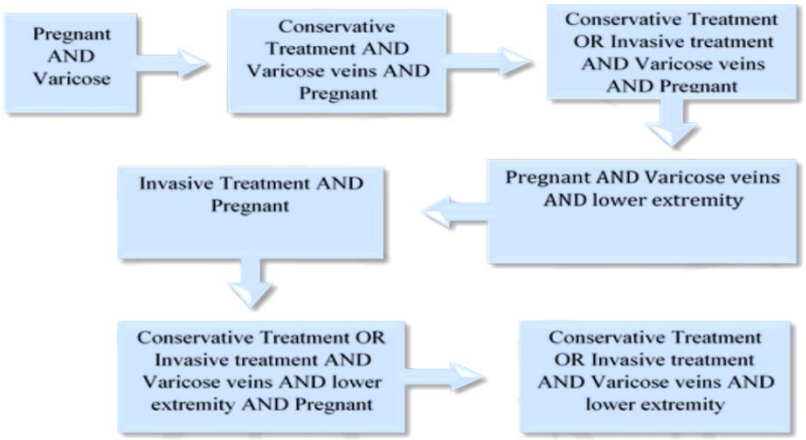

Figure 1. Presentation of the search algorithm, 2017. (Source: Prepared by the authors)

(4) Phase 3: Critical appraisal of the evidence

Different types of instruments were used to validate the information. FLC 2.0 (Critical Reading Sheet) was used, a tool that analyzes the quality of scientific evidence and generates evidence tables. Regarding the Clinical Practice Guidelines (CPG), the latest version of the AGREE II instrument was used. According to Flores and Montoya, [20] it is an instrument developed to critically appraise clinical practice guidelines. Finally, the instrument proposed by Sackett, [21] highly recommended for critically analyzing therapy or intervention studies, was used to interpret the levels of evidence and degrees of recommendation.

(5) Phase 4: Transfer of evidence to clinical practice

Evidence transfer is carried out with the goal of implementing changes in clinical practice (if deemed necessary), so it is important to share these results with healthcare professionals and institutions. Regarding this research, it was decided to disseminate the results obtained through a newsletter containing a summary of the research and the conclusions reached.

Each maternity unit was visited, and a total of 50 newsletters were distributed per hospital. The printed information (newsletters) was provided to the staff free of charge. A total of nine hospitals were visited: Adolfo Carit Eva Hospital, Hospital México, San Juan de Dios Hospital, Dr. Rafael Ángel Calderón Guardia Hospital, San Rafael de Alajuela Hospital, Max Peralta Hospital in Cartago, Ciudad Neily Hospital, Anexión Hospital in Nicoya, and Enrique Baltodano Briceño Hospital in Liberia.

This research was presented to the Gynecology-Obstetric Nursing staff of Adolfo Carit Eva Hospital. Two scientific articles were also published in the School of Nursing's Scientific Journal, in order to promote broader dissemination of the research results.

(6) Phase 5: Evaluation of the results of the use of evidence

Regarding this phase and what pertains to this research, after the transfer of results and implementation of the new practices in healthcare institutions, the evaluation will be the responsibility of healthcare professionals. For the purposes of our study, the evaluation of information transfer is based on the number of nurses who attended the study presentation, the number of informational brochures distributed in the different healthcare institutions, and the publication of two scientific articles.

(7) Ethical considerations

According to Laguna, Caballero, Lewis, Mazueral, et al., [23] plagiarism is the appropriation of someone else's intellectual thought or the copying of research results done by others without authorization. In the study, the articles and scientific documents cited were in accordance with the Vancouver Standards. Regarding conflicts of interest, these are described as when an author has personal or financial relationships that could influence the actions taken. In this study, no conflicts of interest were reported by the researchers. Confidentiality and privacy were also taken into account, which means that users have the right to privacy; their personal or hospital information should not be published unless the user gives informed consent.

3. Results

A total of 322 articles were retrieved in the search, which were then subjected to a series of steps to discard articles that did not answer the clinical question.

Most of the results were obtained using the following categories: Conservative or invasive treatment and varicose veins and lower extremity (136), Pregnant and varicose veins (60), Invasive treatment and pregnancy (48), and Conservative or invasive treatment and varicose veins and lower extremity and pregnancy (42).

The following is a summary of the study selection procedure and the databases in which they were repeated.

Table 3. Summary of the selection process by database, 2017

Selection process	Databases					
	PubMed	Cochrane	Science Direct	SciELo	Other sources	Total
Title	19	4	12	42	12	89
Abstract	15	8	10	39	41	113
Duplicates	47	5	13	8	7	80
No full text	4	6	19	6	2	37
Selected for critical analysis	1	1	1	0	0	3
Total	86	24	55	95	62	322

Source: Prepared by the authors.

Tables 4 and 5 show the information processing of the three articles selected and included for critical analysis, as well as the level of evidence according to the FLC 2.0 and AGREE II programs.

Table 4. Inclusion of articles for critical analysis, 2017

Reference: Short citation: Taylor 2017						
Study	Population	Intervention	Comparison	Results	Conclusion	Comment
Objectives: To highlight the specific physiological and hemodynamic changes that occur during pregnancy and to examine appropriate nonpharmacological, pharmacological, and invasive interventions for the prophylaxis and treatment of primary and secondary chronic venous insufficiency and venous thromboembolism. Search period: 2017. Design: Systematic review of the literature related to VTE and CVI in pregnancy.	The study clearly defines that pregnant women are the target population of the study.	This review article highlights the specific physiological and hemodynamic changes that occur during pregnancy and examines nonpharmacological, pharmacological, and invasive interventions that are appropriate for the prophylaxis and treatment of CVI and venous thromboembolism (VTE).	Non-pharmacological and pharmacological or invasive interventions are compared in the treatment of varicose veins in the lower limbs of pregnant women.	Number of studies and patients: Partially Magnitude of effect: As a result, large, prospective randomized controlled trials are lacking, and data are scarce regarding long-term outcomes for both women and their babies resulting from commonly used pharmacological interventions in non-pregnant women with primary and secondary chronic CVI. On the other hand, rutosides are the most effective intervention for reducing varicose vein symptoms during pregnancy. However, this finding is based on a single study from 1975, with limited data on the safety of the drug during pregnancy. Both reflexology and water immersion were found to reduce symptoms of leg edema; however, these findings were based on single studies that have not been reproduced. Compression garments may also be useful for symptom control and are an inexpensive tool that can be easily applied. The relative risk of developing VTE during pregnancy is high, although the absolute risk remains minimal, so routine VTE prophylaxis is not recommended in current guidelines. Confidence intervals and statistical significance are not noted.	Pregnancy has significant effects on the venous system of the lower extremities. Increased venous diameters and blood volume, combined with reduced flow within the deep veins, predispose pregnant women to primary and secondary CVI. VTE prophylaxis and treatment have been extensively studied in pregnancy, and management guidelines have been published by professional organizations, including the American College of Obstetricians and Gynecologists. Further research is needed to observe the potential effectiveness and long-term safety profiles of new oral anticoagulants in the mother and fetus. Furthermore, there is a need for randomized controlled trials to investigate potential treatment strategies to relieve symptoms associated with varicose veins and venous stasis.	The physiological changes throughout the arterial and venous system during pregnancy are well documented. However, there is a paucity of data available to inform care guidelines, particularly in pregnant patients with varicose veins that could progress to symptomatic superficial venous insufficiency. Further research in the form of prospective randomized trials is required to establish appropriate treatment guidelines.
Quality of evidence	medium					

Reference: Smyth 2015						
Study	Population	Intervention	Comparison	Results	Conclusion	Comment
To assess any form of intervention used to relieve symptoms associated with varicose veins and leg edema in pregnancy. Search period: No start date reported, but the search ended on 5/2015. Design: Randomized trials of treatment for varicose veins or leg edema, or both, in pregnancy.	Pregnant women with varicose veins or leg edema, or both, at any stage of pregnancy.	Any described method used to treat varicose veins or leg edema compared with placebo or no treatment, or any other method. These may include: 1. Pharmacological interventions (sclerotherapy or phlebotonics) 2. Non-pharmacological interventions (compression stockings, leg elevation, any form of rest, any form of exercise, water immersion, reflexology, physiotherapy, massage) 3. Surgical interventions.	1. Rutosides vs. Placebo. 2. Intermittent external pneumatic compression vs. Rest. 3. Reflexology vs. Rest. 4. Lymphatic reflexology vs. Relaxation reflexology. 5. Water immersion vs. Leg elevation. 6. Foot massage vs. Routine care.	There are 6 studies: 1. Rutoside vs Placebo: 69 women. 2. External pneumatic compression vs Rest: 35. 3. Lymphatic reflexology vs Relaxation reflexology: 45. 4. Reflexology vs Rest: 55 women. 5. Water immersion vs Leg elevation: 32 women. 6. Foot massage vs Usual care: 80 women. Magnitude of effect: 1. Rutoside vs Placebo: Significantly reduced symptoms associated with varicose veins (risk ratio [RR] 1.89, 95% confidence interval [CI] 1.11 to 3.22; moderate-quality evidence). The incidence of complications (deep vein thrombosis) did not differ significantly between the two groups (risk ratio [RR] 0.17, 95% CI 0.01 to 3.49; moderate-quality evidence). 2. Intermittent External Pneumatic Compression vs Rest: No significant difference in lower leg volume when compression stockings were compared to rest (mean difference (MD) -258.80, 95% CI -566.91 to 49.31). 3. Reflexology vs Rest: Reflexology significantly reduced symptoms associated with edema: RR9.09, 95% CI1.41 to58.54). The study showed a trend towards satisfaction and acceptability with the intervention (RR 6.00, 95% CI 0.92 to 39.11). 4. Water Immersion vs Leg Elevation: Water immersion for 20 minutes in a swimming pool reduced leg volume (RR 0.43, 95% CI 0.22 to 0.83). 5. Foot massage vs. Routine care: No significant difference in leg circumference when foot massage was compared with routine care (MD -0.11, 95% CI -1.02 to 0.80).	1. Rutosides appear to help women with varicose veins who are experiencing symptoms (night cramps, tiredness, paresthesia). However, the research did not present sufficient data to assess safety in pregnancy (40 years). It is not clear that the drug is safe enough to use in pregnancy. 2. The most common treatments for venous insufficiency in pregnancy are compression stockings and foot elevation. Neither of these methods has been adequately evaluated in a randomized controlled trial. No significant differences in leg volume (edema) were found with compression stockings when compared with rest or foot massage with routine foot care. 3. The safety of both pharmacological and non-pharmacological interventions in this review cannot be verified from the available data. 4. No clear guidance can be provided regarding any form of intervention to restore symptoms associated with varicose veins and edema in pregnancy. The need for large, well-designed randomized controlled trials to allow for more robust conclusions has been identified. 5. The available evidence is insufficient to draw reliable conclusions for clinical practice.	The research conducted a thorough evaluation of each study and the interventions used. The evidence found regarding varicose vein interventions during pregnancy is limited and outdated. Randomized controlled trials with larger populations are needed to support the appropriateness of the intervention.
Quality of evidence		High				

Source: Prepared by the authors.

Table 5. AGREE II. Varicose veins in the legs. The diagnosis and management of varicose veins. Clinical Guideline Methods, 2013

Domain 1: Scope and objective						Domain 2: Participation of those involved				
Score 97%						Score 92%				
	Item 1	Item 2	Item 3	Total			Item 4	Item 5	Item 6	Total
Evaluador 1	5	7	7	21		Evaluador 1	7	7	7	21
Ealuador 2	4	6	7	20		Ealuador 2	5	6	7	18
Total	9	13	14	41		Total	12	13	14	39

Domain 3: Rigor in elaboration									
Score 85%									
	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item13	Item 14	Total
Evaluador 1	7	7	6	7	7	7	6	6	53
Ealuador 2	7	6	5	6	6	6	5	4	45
Total	14	13	11	13	13	13	11	10	98

Domain 4: Clarity in presentation						Domain 5: Applicability					
Score 92%						Score 87%					
	Item 15	Item 16	Item 17	Total			Item 18	Item 19	Item 20	Item 21	Total
Evaluador 1	7	7	7	21		Evaluador 1	5	7	7	7	26
Ealuador 2	6	6	6	18		Ealuador 2	4	6	7	7	24
Total	13	13	13	39		Total	9	13	14	14	50

Domain 6: Stakeholder participation						Overall evaluation of the guide		
Score 75%						Score 83%		
	Item 22	Item 23		Total			Global quality	Recommend
Evaluador 1	5	7		12		Evaluador 1	6	Yes
Ealuador 2	4	6		10		Ealuador 2	6	Yes
Total	9	13		22		Total	12	Yes

Source: Own elaboration

4. Discussion

According to Taylor et al. [24] in their article entitled "The Hemodynamic Effects of Pregnancy on the Lower Extremity," chronic venous insufficiency is the result of structural and biochemical abnormalities in the venous wall. The authors point out that the management of this condition is divided into three main groups: pharmacological treatments, non-pharmacological treatments, and surgical treatments. When this type of condition occurs, edema is a possible condition, establishing the primary objective of symptom reduction and the use of pharmacological and non-pharmacological approaches. [25]

Similarly, Smyth et al. [11] state that methods for treating varicose veins or lower extremity edema in pregnant women include pharmacological interventions such as phlebotonics or sclerotherapy, and non-pharmacological interventions such as the use of compression stockings, leg elevation, rest, exercise, water immersion, and reflexology. Finally, surgical interventions are a third option.

Another author also mentions that phlebotonics are pharmacological treatments that work by increasing venous tone and preventing edema. [26] Although these drugs have venotonic mechanisms of action, most studies show low-quality evidence of benefit. In a Cochrane literature review, only 28% of the included studies on this topic included standard diagnostic criteria.

Regarding the above, Smith et al. [11] in their study define phlebotonics as venoactive drugs that are associated with increasing venous tone and preventing edema.

These drugs include rutosides, hydrosmine, diosmine, calcium dobesilate, chromocarbon, centella asiatica, disodium phloberdate, French maritime pine bark extract, grape seed extract, aminaftone, and O-(b-hydroxythylrutoside), a semisynthetic compound. Although rutosides may help in the management of varicose veins, it is still unknown whether the drug is safe during pregnancy.

In this context, Bergstein [27] conducted an RCT comparing the efficacy of the oral phlebotonic O-(b-hydroxyethyl) rutoside with placebo for the treatment of varicose veins during pregnancy. This study showed that rutoside significantly reduced symptoms associated with varicose veins, with a RR of 1.89 and a 95% CI of 1.11 to 3.22. In this study, there were no statistically significant differences in the rate of side effects between the treatment groups.

Regarding these drugs, Smyth et al. [11] also reported that rutosides are the most effective intervention for reducing varicose vein symptoms during pregnancy.

This was reaffirmed by Rodríguez et al. [28] in 2017 in their study entitled "Updating the Treatment of Venous Insufficiency in Pregnancy" when they stated that there is moderate-quality evidence suggesting that rutosides appear to help alleviate the symptoms of varicose veins at the end of pregnancy and that these drugs have a beneficial effect in treating chronic venous insufficiency in the third trimester.

From a different perspective, other types of invasive treatments are analyzed, specifically venous ablation therapies, sclerotherapy, and surgical treatments for the management of varicose vein disease in pregnant women. Regarding this topic, Rodríguez et al. [28] stated that venous ablation therapies are generally contraindicated during pregnancy and that surgical options should be considered at least two months after pregnancy, since many of the symptoms of venous disease in pregnant women reverse during this period.

Some researchers have proposed radical surgery, sclerotherapy, or a combination of both as the definitive treatment for varicose veins during pregnancy. However, Greenstone et al. [29] mention that the use of sclerosants could increase the risk of uncontrolled ascending thrombophlebitis. These same authors report that the incidence and recurrence are much higher when radical surgery is performed during pregnancy, due to increased venous pressure, obstruction of venous drainage from the lower extremities, and hormonal factors.

Similarly, Smyth et al. [11] point out that surgical treatment of varicose veins is contraindicated during pregnancy, and that a decision should be made at least two months after delivery due to the large number of manifestations of chronic venous insufficiency that spontaneously reverse during this period. This is also stated by Cleave et al. [30] in their article entitled "Varicose Veins and Pregnancy," stating that active treatment during pregnancy is reserved for severe varicose veins with valvular incompetence that do not respond to conservative treatment.

Solanki et al. [31], in the Clinical Guideline entitled "Varicose Veins in the Legs: The Diagnosis and Management of Varicose Veins," consider that the clinical benefits of invasive treatment for varicose veins during pregnancy do not outweigh the potential harm to the woman and the fetus. They state in this study that the primary concern is safety for the mother-child relationship and that the treatment is not recommended for pregnant women. Despite this, researchers note that there may be some exceptional situations where intervention could be considered.

There is a general consensus that this time should be 3 to 6 months due to the body's normalization after delivery and to reduce the risk of introducing drugs to the infant during breastfeeding.

On the other hand, Taylor et al. [24] point out that the focus of nonpharmacological treatment is to minimize the need for invasive measures. They report that nonpharmacological methods for treating venous insufficiency in pregnant women include the use of compression stockings, rest, leg elevation, reflexology, water immersion, and massage. They also consider that some conservative treatments such as reflexology or water immersion appear to help improve symptoms in women with leg edema, but again, this is based on two small studies of 43 and 32 women, respectively. These studies found that both reflexology and water immersion reduced the symptoms of leg edema. However, these findings were based on single studies that have not been replicated.

On the other hand, non-pharmacological interventions, including bandages, compression stockings, and leg elevation, are cited as potentially relieving discomfort and improving symptoms in some women; however, evidence to support these therapies is lacking. [26]

Some of these studies have shown that reflexology may further reduce CVI symptoms compared to rest and water immersion. It is an ancient natural therapy in which finger and thumb pressure is applied to flexor points on the feet, hands, and ears to realign certain areas of the body. Lymphatic reflexology is a version of this technique that mimics lymphatic drainage, helping to move extravascular fluid into the intravascular space in edematous lower limbs. Water immersion produces the same effect, but it utilizes hydrostatic pressure exerted evenly on the legs.

Other authors, such as Nesbitt et al. in 2014, stated that the most commonly used techniques in the general treatment of varicose veins are conservative treatment, also known as compression therapy, or interventional treatments. However, pregnant patients with varicose veins should ideally be treated with compression therapy, sclerotherapy, and phlebectomy.

Jamieson, Calderwood, and Greer evaluated the use of compression stockings in the immediate postpartum period and found a reduction in the diameter of the common femoral vein with an increase in venous blood velocity after 30 minutes of compression therapy. This indicates that compression treatment is successful in reducing venous stasis in the postpartum period and decreasing the risk of CVI. Similarly, Smyth et al. mention that compression stockings can relieve leg swelling and pain, preventing the development of further varicose veins. They state that they should be worn during the day and removed at night, and that graduated compression stockings should be worn along the leg to better promote venous return to the heart.

In this context, Smyth et al. [11] reaffirm that the most common treatments for venous insufficiency in pregnancy are compression stockings and foot elevation; however, neither of these methods has been adequately evaluated in the context of a randomized controlled trial.

Greenstone et al. [29] are the authors who support the idea that basic management of all degrees of varicose veins during pregnancy should be conservative, such as adequate elastic support with sufficient strength to keep the varicose veins fully compressed. Likewise, Taylor et al. [24] and Solanki et al. [31] consider compression therapy to be advantageous because it is inexpensive and easy to apply, but its main limitation is user noncompliance, which limits its effectiveness.

Like the previous authors, Carrasco [34] believes that compression stockings during pregnancy do not prevent the development of varicose veins, but they can reduce the incidence of venous insufficiency and improve symptoms. Likewise, Rodríguez et al. [28] in their research point out that the correct use of this method has proven to be the most effective treatment for chronic venous insufficiency, as its mechanism of action is to improve venous return by reducing venous pressure and reflux. They also delay the progression of the disease.

Despite the above, Thaler et al. [2] in a trial demonstrated that the use of prophylactic compression stockings did not prevent the development of varicose veins but did significantly reduce the incidence of saphenous vein reflux at the saphenofemoral junction and improved leg symptoms. Similarly, Solanki et al. [31] point out that the improvements in quality of life associated with compression therapy likely justify the additional cost; therefore, this method is considered cost-effective for women during pregnancy.

Another relevant argument presented throughout this research is that of Taylor et al., who asserts that there is a need for randomized controlled trials to investigate potential treatment strategies to relieve the symptoms of varicose veins and venous stasis. The author points out that there are strategies for managing pregnancy-associated venous disease in the lower extremities. However, the quality and scope of scientific research based on the management of early-stage varicose veins during pregnancy is unfortunately modest.

On the other hand, the group of researchers who led the development of the Clinical Guidelines by Solanki et al. concluded that the clinical benefits of treating varicose veins with compression stockings during pregnancy may outweigh the potential harm to the mother or fetus. They consider interventional therapies contraindicated during pregnancy and therefore point to compression therapy as the only viable option, which has even demonstrated an improvement in the quality of life of users. However, they agree with many authors on the need for larger studies.

5. Conclusion

Compression stockings are considered the most indicated treatment for the relief and reduction of symptoms associated with varicose veins during pregnancy; however, they do not prevent their subsequent onset. Compression treatment has not been adequately evaluated in a rigorous and reliable randomized controlled trial that would allow for the establishment of clear guidelines. Similarly, rutosides and oral anticoagulants appear to help women with varicose veins during pregnancy; however, based on scientific evidence, it is not clear that these medications are sufficiently safe for both the mother and the fetus during pregnancy.

Invasive treatment, including surgery, is not recommended during pregnancy because the risks outweigh the benefits. It is suggested that these types of interventions should not be performed during pregnancy only in delicate cases that warrant it. The literature suggests that the appropriate time for invasive treatment, including surgery, is when the user considers she no longer wishes to have children, or a few months after the baby is born.

Reflexology, foot massage, and water immersion appear to help reduce lower limb edema in pregnant women.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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