European Journal of Obstetrics & Gynecology and Reproductive Biology 219 (2017) 124–128

Contents lists available at ScienceDirect

European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: www.elsevier.com/locate/ejogrb

Full length article

Does ligation of internal iliac artery for postpartum hemorrhage affect clitoral artery blood flow and postpartum sexual functions?

B. Kaya[a,*], B. Usluogullari[b], N. Yurttutan[c], M.H. Sahan[d], O. Güralp[e], E. Malik[e]

[a] Department of Obstetrics and Gynecology, Near East University Faculty of Medicine, Lefkosa, TRNC, Mersin-10 Turkey
[b] Department of Obstetrics and Gynecology, Medical Park Hospital, Gaziantep, Turkey
[c] Department of Radiology, Faculty of Medicine, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey
[d] Department of Radiology, Kirikkale University Faculty of Medicine, Kirikkale, Turkey
[e] Department of Obstetrics and Gynecology, Klinikum Oldenburg University Hospital, Oldenburg, Germany

ARTICLE INFO

Article history:
Received 9 July 2017
Received in revised form 23 October 2017
Accepted 30 October 2017
Available online xxx

Keywords:
Clitoral artery
Doppler ultrasonography
Internal iliac artery
Postpartum hemorrhage
Postpartum sexual functions

ABSTRACT

Objective: To investigate whether internal iliac artery ligation (IIAL) for postpartum hemorrhage (PPH) affects the sexual life in the postpartum period or significantly reduces the clitoral artery blood flow.
Study design: The women who underwent IIAL due to PPH during cesarean section (CS) were compared with healthy postpartum women delivered by CS between October 2014 and February 2016 in the Gaziantep Women's Health and Maternity Hospital, Gaziantep, Turkey. Clitoral Doppler flow measurements and the Female Sexual Function Index questionnaire (FSFIQ) were performed in all women in the 3rd and 6th postpartum months. This study was registered at ClinicalTrials.gov with the identification number NCT02409602.
Results: Mean age, gravidity and parity, body mass index (BMI), first sexual intercourse after childbirth, and education years were similar in both groups. There was no statistically significant difference in the measurements of RI, PI, PSV, EDV, and S/D between the study and control groups in the 3rd month. Lack of statistical significance was also noted between the study and control groups values in the 6th month, as well as between the 3rd and 6th month's values within both the study group and the control group. Additionally, there were no statistically significant differences in the total FSFI scores including sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction, and pain domain scores between the study and control groups in the 3rd month; between the study and control groups 6th months; whereas all scores were higher in the 6th month compared to the 3rd month within each group.
Conclusion: IIAL does not affect the blood flow of the dorsal clitoral artery between the 3rd and 6th months postpartum and between the women who underwent IIAL due to PPH and healthy postpartum women. The sexual function scores were significantly higher in the 6th month compared to the 3rd month in both groups.

Introduction

Internal iliac artery ligation (IIAL) is one of the oldest conservative techniques used to control bleeding in postpartum hemorrhage (PPH) [1] and still plays a role in the management of PPH before proceeding to hysterectomy when other conservative methods fail [2,3].

The well-known experimental hemodynamic study of Burchell [4] showed that IIAL is associated with a 49% decrease of pelvic blood flow and an 85% decrease in pulse pressure. However, the effects of IIAL on pelvic circulation have only been investigated in several studies and reported in some case reports [5–8] which focused on the uterine artery, arcuate artery, and ovarian branch of the uterine artery. Among the anterior branches of the internal iliac artery, the uterine artery, internal pudendal artery, and vaginal artery are the main suppliers for the gynecological organs. The dorsal clitoral artery is a branch of the internal pudendal artery and supplies blood to the clitoris. Studies on the role of the clitoris in female sexuality have shown that sexual functions can be impaired with diminished blood flow to the clitoris [9–11] or vice versa [10,12,13]. Color Doppler ultrasonography may be a convenient technique to evaluate the female sexual function by evaluating clitoral blood flow [21–23]. Moreover, hemodynamical alterations were well demonstrated with clitoral Doppler evaluations in several studies [10–12].

* Corresponding author.
E-mail address: mdbariskaya@gmail.com (B. Kaya).

https://doi.org/10.1016/j.ejogrb.2017.10.029
0301-2115/

The sexual function is a complex phenomenon, depending on many psychological, physical, and environmental factors. The overall constellation of anemia, physical and psychological stress, weakness, and longer healing periods may also contribute to reduced sexual function. In order to deductively investigate the role of possible factors other than blood flow, "a female sexual function index questionnaire" (FSFIQ) was given to all women in the 3rd and 6th postpartum months in both groups.

Therefore, the objective of this study was to investigate whether IIAL significantly reduces the clitoral artery blood flow and if the overall constellation affects the sexual life in the postpartum period.

Material methods

This is a prospective, case control comparative study. A total of 11 women who underwent IIAL for postpartum hemorrhage (PPH) during cesarean section (CS) were compared with 23 healthy postpartum women delivered with CS in the 3rd and 6th postpartum months with clitoral Doppler flow and FSFIQ between October 2014 and February 2016 in the Gaziantep Women's Health and Maternity Hospital, Gaziantep, Turkey. Local Ethical Committee approval is obtained before the study began. This study was registered at ClinicalTrials.gov with the identification number NCT02409602. Eligibility criteria included women between 18 and 35 years old, married, sexually active before pregnancy, and managed with IIAL due to PPH during cesarean delivery. Women with a known vascular pathology before and/or during pregnancy (diabetes mellitus [DM], systemic lupus erythematosus [SLE], systemic sclerosis, and other vascular autoimmune disorders), smokers, psychiatric disorders or sexual dysfunction diagnosed before pregnancy, women who underwent oophorectomy during cesarean section, other vessel ligations prior to IIAL or additional IIAL (uterine branch of ovarian artery), morbidly adherent placenta, lower genital tract lacerations, cessation of breastfeeding, and postpartum blues syndrome were excluded.

Our search in the PubMed database with the keywords "doppler AND clitoris AND artery AND puerperium"; "sexual function AND puerperium AND hypogastric artery"; "sexual function AND hypogastric artery" yielded no study with identical methodology. Considering similar studies about the branches of the internal iliac artery, we aimed to reach a sample size of 20 women in each group. However, due to the low number of patients during the study period, only 15 women could be enrolled in the study group. Two women chose not to join the study and two women did not come to the follow-up. In order to increase the power of the study, the number of women in the control group was increased to 23 to achieve a power of 95% according to resistance index (RI) values.

Eleven women who underwent IIAL and 23 postpartum healthy controls were evaluated with clitoral Doppler and the FSFIQ in the 3rd and 6th months after delivery.

Colour Doppler ultrasound was performed on all subjects to measure clitoral blood flow in the 3rd and 6th months after delivery. Ultrasound was performed using a Mindray M5 Ultrasound System (*China*) equipped with a convex 7.5 MHz probe. Each woman was scanned in the lithotomy position by a radiologist (NY) blinded to the groups who did not know which women had undergone IIAL. The Doppler translabial probe was positioned sagittally and transversally on the clitoris without enforcing any significant pressure on the tissues. Clitoral artery was identified using colour flow mapping. At least three subsequent Doppler waveforms of clitoral artery were obtained. The following parameters were evaluated: peak systolic velocity (PSV), end diastolic velocity (EDV), resistance index RI, pulsatility index (PI), and systolic/diastolic (S/D) ratio (Fig. 1).

The FSFI questionnaire, originally introduced by Rosen [14], evaluates the sexual desire, sexual arousal, lubrication, orgasm, sexual satisfaction, and pain subgroups in the previous 4 weeks with a total of 19 questions. Each subgroup score was multiplied by the subgroup factor. The total FSFI score was defined as the sum of all scores obtained in each subgroup, and a higher FSFI score indicated a better overall sexual function. The Turkish version of

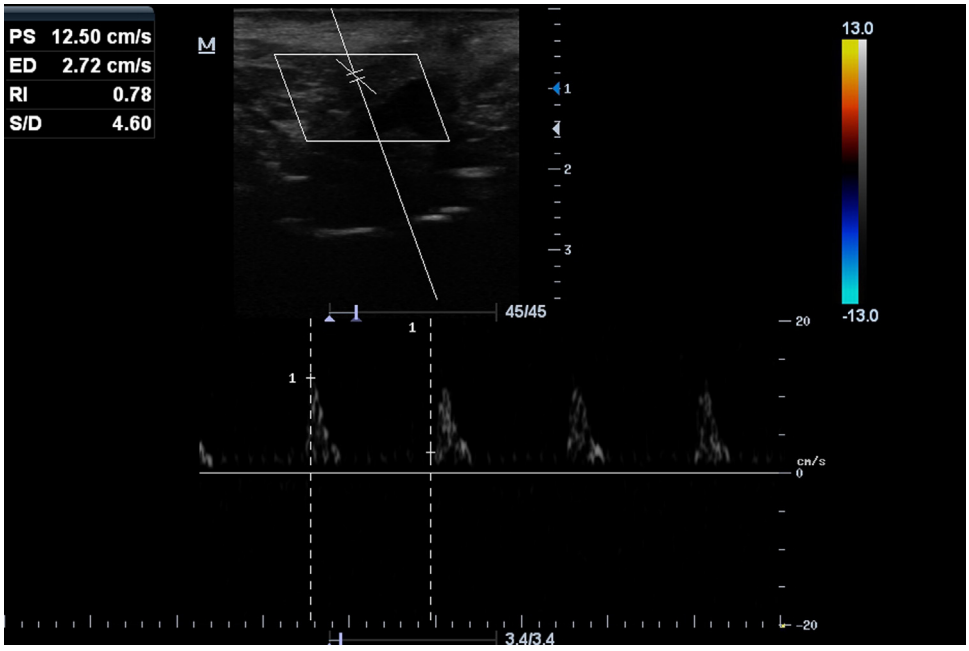

Fig. 1. Ultrasound view of PSV, EDV, RI and S/D measurements between 45 and 60°, which shows proper spectral analyses window of a Dorsal Clitoral Artery Doppler Measurement in a patient at 3rd month.