Letter to the Editor

The role of uterine arteries Doppler indices in assisting decision-making for intramural fibroid removal in patients with infertility before in vitro fertilization

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Dear Editor, fibroids are relatively common in women. There are many challenges in treating patients with intramural fibroids before *in vitro* fertilization (IVF). The size of intramural fibroids and the consequent cavity distortion, accompanying morbidities, expense, and delay in fertility therapies are the most investigated aspects. Despite several studies, there is no clear agreement regarding the management of these fibroids before IVF to promote fertility.

Different ultrasonographic techniques have been developed to evaluate endometrial receptivity. Previous studies have shown that the mean uterine artery (UtA) Doppler index is higher in women with unexplained infertility than in fertile women [1]. Also, it was found in the study by Cacciatore and et al. [2] that there was a substantial difference between the IVF and natural cycles in terms of the uterine artery pulsatility index (PI), with a mean reduction of 18 percent. This demonstrates that stimulating superovulation decreases the impedance of uterine circulation to flow [2]. The UtA PI and resistive index may be utilized as non-invasive factors prior to human chorionic gonadotropin stimulation to predict the results of IVF, as shown in a previous study [3]. UtA Doppler indices, which are useful for predicting pregnancy complications, including malplacentation and preeclampsia (PE), may also be used to evaluate uterine receptivity. The evidence is limited to fibroids that may or may not affect UtA Doppler indices. Theoretically, decreased fertility may result from uterine fibroids that reduce blood flow [4]. Further research is needed to determine which types of fibroids, in what locations,
and with what sizes and shapes may affect UtA Doppler indices. Before that, the normal range for non-pregnant women is needed as a baseline for comparison, and it may even be essential to adjust this value for the induction of ovulation medicines and UtAs Doppler changes in infertile women. Therefore, it may be better to define our normal population as women who are infertile during the IVF cycle. However, measurements taken far above the uterine-iliacl-arterial junction, as well as those taken transvaginally, result in considerable variations in the mean UtA-PI \([5]\); therefore, the same method should be used for all cases. There are insufficient data to determine whether UtAs Doppler indices (particularly increased PI) can help predict the need for intramural fibroid removal prior to IVF based on their effect on endometrial receptivity and pregnancy outcomes such as miscarriage, PE, and fetal growth restriction. In the future, the use of these Doppler indices along with other factors may help patients benefit from intramural fibroid removal before IVF.

Of note, the uterine radial artery has gained considerable attention in recent years among the uterine arteries, owing to its path through the myometrium. Moreover, investigations have demonstrated that evaluating the encircling vessels of the endometrium, specifically the endometrial spiral arteries, may offer greater insight into endometrial receptivity, as they directly affect the endometrium, in contrast to the uterine artery. Therefore, the impact of
fibroids on the vascular system, including the uterine, radial, and endometrial spiral arteries, requires careful consideration of their location and size in clinical decision-making [6].

Conflict of interest

The authors have no conflicts of interest to declare.

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