

## Role of MicroRNA for detection of early stage of Endometriosis

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Madam, Endometriosis is a leading gynaecological disorder in 15% of females between the ages of 14 and 35.<sup>1</sup> Implantation of endometrium in extra uterine tissue is manifested by abdominal and pelvic pain, dyspareunia and subfertility.<sup>1</sup> Depending on site and spread of endometrial tissues, endometriosis is categorized into;

It has been found that miRNA-20a dysregulation causes hypoxic stress, promotes angiogenesis by targeting Vascular Endothelial Growth Factor (VEGF), stimulates high COX-2 production leading to cell proliferation, development of endometriotic tissues and inflammation at the endometriotic site (Figure).<sup>3</sup>

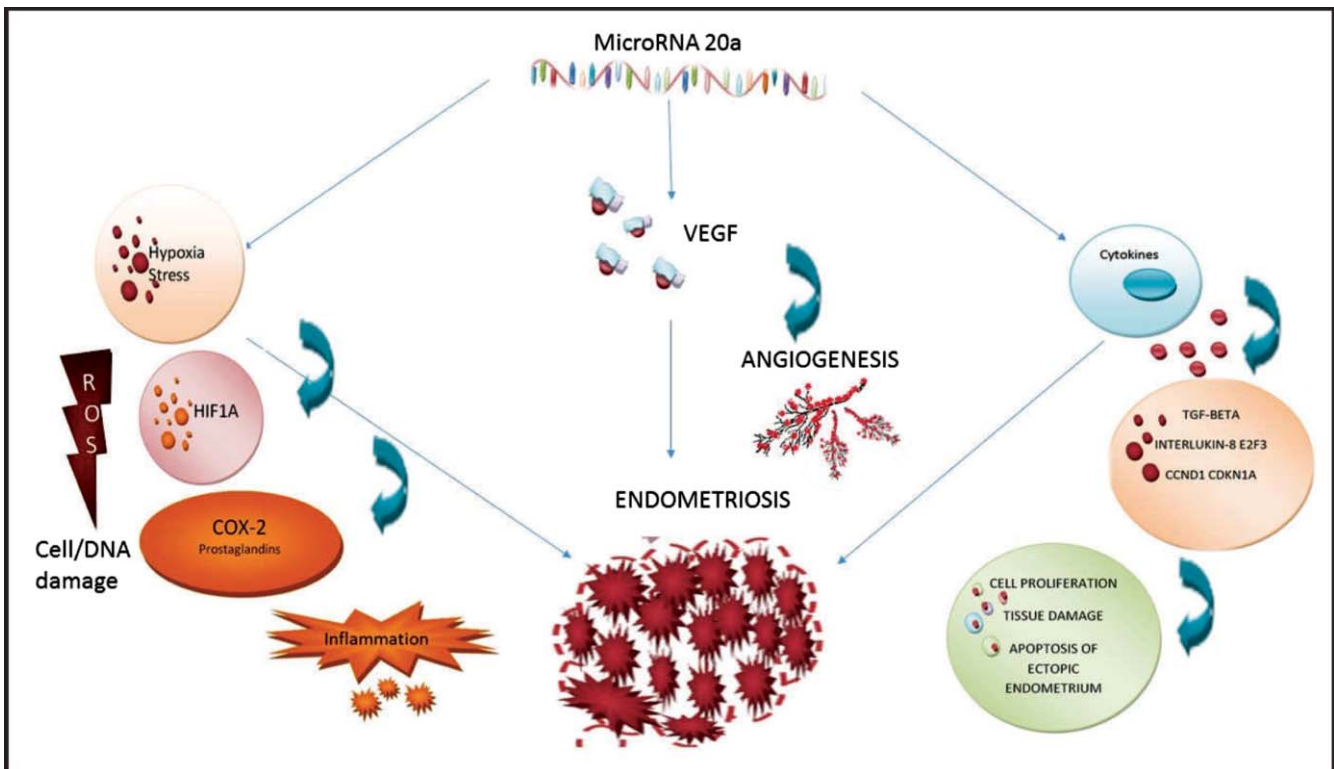


Figure: Factors contributing in genesis of ectopic endometrium: endometriosis.

(Stage I (minimal), Stage II (mild), Stage III (moderate) and Stage IV (severe)).<sup>2</sup> Currently laparoscopy is the gold standard criterion for diagnosis of endometriosis.

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Likewise, miRNA-145 level was found to be elevated in the early stages (Stage 1 and 2) as compared to the late stages (Stage 3 and 4) in the plasma of endometriotic patients. The relative down regulation of miRNA-145 also facilitates invasion and proliferation of endometriotic lesions, through the greater expression of genes associated with stem cell activity.<sup>4</sup> Also the miRNA-200 family leads to Epithelial-Mesenchymal Transition, through the suppression of E-Cadherin playing a key role in the

penetration of ectopic endometrial tissues.<sup>5</sup>

The global literature on association of miRNA and endometriosis hence needs to be explored further for the cause effect relationship and identification of a non-invasive method. We are hopeful that the derived results will help in screening of early stages of Endometriosis by biochemical assays rather than putting the patient to the trauma of laparoscopy and subsequent consequences.

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## References

1. Panir K, Schjenken JE, Robertson SA, Hull ML. Non-coding RNAs in endometriosis: a narrative review. *Hum Reprod Update*. 2018; 24:497-515.
2. Agarwal N, Subramanian A. Endometriosis - morphology, clinical presentations and molecular pathology. *J Lab Physicians*. 2010; 2:1-9.
3. Agrawal S, Tapmeier T, Rahmioglu N, Kirtley S, Zondervan K, Becker C. The miRNA Mirage: How Close Are We to Finding a Non-Invasive Diagnostic Biomarker in Endometriosis? A Systematic Review. *Int J Mol Sci*. 2018; 19. pii: E599.
4. Bashti O, Noruzinia M, Garshasbi M, Abtahi M. miR-31 and miR-145 as Potential Non-Invasive Regulatory Biomarkers in Patients with Endometriosis. *Cell J*. 2018; 20:84-9.
5. Rekker K, Saare M, Roost AM, Kaart T, Sõritsa D, Karro H, et al. Circulating miR-200-family micro-RNAs have altered plasma levels in patients with endometriosis and vary with blood collection time. *Fertil Steril*. 2015; 104:938-946.e2.

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