

Role of some MiRNA Affecting Polycystic Ovarian Syndrome and SIRT1 levels

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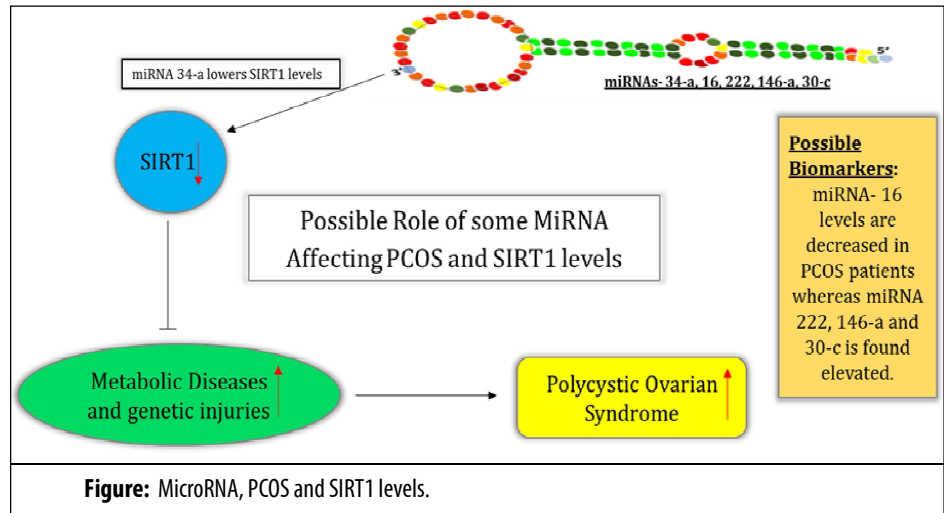
Dear Editor, Polycystic Ovarian Syndrome (PCOS) is an ovarian dysfunction with clinical manifestations such as menstrual irregularities, signs of hyperandrogenaemia, obesity and because of hyperinsulinaemia, risk of developing type 2 diabetes mellitus. PCOS development also include genetic, environmental and lifestyle factors.¹

Sirtuin 1 (SIRT1) is an NAD⁺-dependent deacetylase protein that plays an important role in cellular/metabolic stress or gene injury.² As PCOS is a physiological dysfunction associated with inflammation, immune system and insulin metabolism, SIRT1 levels have been observed higher in PCOS patients than in a healthy person.³ MiRNAs are nucleotide regulatory RNAs and its activation helps for transition of a cell from one state to another therefore playing a critical role in many cells such as cell proliferation, development, survival and apoptosis particularly in the granulosa cells of the ovary.⁴ In some metabolic diseases miRNA are highly expressed revealing them as a target to study for diseases associated with SIRT1 dysfunction and PCOs (Figure). Therefore any overexpressed biomarker related to SIRT1 and PCOS would be a helpful diagnostic tool.²

In obesity and metabolic disorders miRNA-34a binds to 3'-UTR of SIRT1 gene and lowers its expression, as SIRT1 activity become dysfunctional, metabolic stress, inflammation and PCOS elevated.² We can target miRNA-34a as a therapeutic factor for PCOS, whereas miRNA 16(decreased expression) and miRNA -222, 146a and

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30c(increased expression)^{3,5} can be used as a possible biomarkers for PCOS diagnosis for further research exploration and can help derive positive results to ease the patients trauma and pain.

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Conflict of Interest: None to declare.

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References

1. Fu X, He Y, Wang X, Peng D, Chen X, Li X, et al. MicroRNA-16 Promotes Ovarian Granulosa Cell Proliferation and Suppresses Apoptosis Through Targeting PDCD4 in Polycystic Ovarian Syndrome. *Cell Physiol Biochem* 2018; 48: 670-82.
2. Choi SE, Kemper JK. Regulation of SIRT1 by microRNAs. *Molecules* 2013; 36: 385-92.
3. Kiyak Caglayan E, Engin-Ustun Y, Gocmen AY, Polat MF, Aktulay A. Serum sirtuin 1 levels in patients with polycystic ovary syndrome. *J Obstet Gynaecol* 2015; 35: 608-11.
4. Christenson LK. MicroRNA control of ovarian function. *Animal Reprod* 2010; 7: 129-33.
5. Humplikova L, Kollinerova S, Papajik T, Pikalová Z, Holzerová M, Prochazka V, et al. Expression of miR-15a and miR-16-1 in patients with chronic lymphocytic leukemia. *Biomedical papers of the Medical Faculty of the University Palacky, Olomouc, Czechoslovakia*: 2013;157.

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