Study of the effect of N-acetyl Cysteine (NAC) on apoptotic factors in granulosa cells of women with polycystic ovarian syndrome

Sajed Khaledi[1], Reza Shirazi[2*], Shabnam Bakhshalizadeh[3]

1- Department of Anatomical Sciences, Faculty of medical sciences, Iran University of Medical Sciences, Tehran, Iran

2- Department of Anatomical Sciences, Faculty of medical sciences, Zanjan University of Medical Sciences, Zanjan, Iran

3- Department of Anatomy, Faculty of medical sciences, Medicine & Health, UNSW Sydney, Sydney, Australia

Objective: Polycystic ovary syndrome (PCOS) is a very common endocrine disorder and one of the causes of infertility among women. Among the factors involved in the development of PCOS and its related symptoms, Oxygen reactive species (ROS) can be mentioned, which increases the number of atretic follicles, which occurs as a result of an increase in apoptosis in granulosa cells of the follicles. In this study, NAC was used as a potent antioxidant to reduce oxidative stress and thus reduce apoptosis in granulosa cells in women with PCOS and its effect on apoptotic expression was studied**.**

Materials and Methods: 60 women entered the study with specific Inclusion and exclusion criteria and divided into 3 groups of 20 people. The first group consisted of 20 women with PCOS who received NAC 600 mg daily for three consecutive days for six weeks, The second group included 20 women with PCOS who received placebo three times a day for six weeks and The third group included 20 women with normal ovarian function and infertility problems due to male or mechanical factors. Follicular fluid was collected after oocyte pancreas in these patients and granulosa cells were isolated. The expression of the pro-apoptosis genes such as caspase-3 and Bax, and the anti-apoptosis genes such as Bcl-2 and XIAP were investigated in different groups using the Real Time PCR. TUNEL assay was also performed to evaluate apoptosis rate in different groups.

Results: Our results revealed a significant upregulation of BCL2 and XIAP and also downregulation of BAX and Caspase3 in NAC treated patients when compared with placebo group. TUNEL assay showed NAC can decrease the apoptosis in PCOS women.

Conclusion: Based on present study prescription of NAC can improved fertility rate and can be used for PCOS women.

Key words: Polycystic ovary syndrome, Granulosa cells, Apoptosis, NAC