

Effects of metabolism on quality of life in PCOS-patients under metformin therapy

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Objective

Polycystic Ovary Syndrome (PCOS) is an endocrine-metabolic disorder affecting 8%-18% of women globally. The condition is characterized by a range of symptoms, including obesity, insulin resistance, and mental health issues, all of which may contribute to a reduced health-related quality of life (HRQOL). Although metformin has been shown to improve HRQOL in PCOS patients, it remains unclear whether these benefits are directly due to the drug or are secondary to its metabolic effects.

Design

This study enrolled PCOS patients from the Fertility Center at the University Medical Center Mainz. Based on individual metabolic profiles, participants were divided into two groups: those receiving metformin therapy and those receiving alternative treatments or no treatment.

Methods

HRQOL and distress were assessed at baseline and after 24 weeks using the Modified PCOS-Questionnaire (MPCOSQ) and the Hospital Anxiety and Depression Scale (HADS). Comprehensive metabolic markers were assessed in all patients, allowing for monitoring of their metabolic response to the therapy. Statistical analyses were conducted using multivariate linear regression to explore the relationship between metabolic improvements and changes in HRQOL and distress.

Conclusions

Our study found that patients under metformin therapy showed more substantial improvement in HRQOL and distress compared to PCOS patients without metformin therapy. These effects were largely mediated by changes in metabolic markers rather than a direct impact of the therapy itself.

Results

The study included 66 patients with confirmed PCOS, divided into two groups: 31 patients in the metformin-treated group (M-group) and 35 patients in the comparison group (C-group). At baseline, the M-group exhibited worse metabolic parameters compared to the C-group, including Homeostatic Model Assessment for Insulin Resistance (HOMA-IR) ($p<0.001$), waist circumference ($p<0.001$), Visceral Adiposity Index (VAI) ($p=0.049$), and Fatty Liver Index ($p<0.001$). By follow-up, the M-group showed greater improvements in these metabolic markers, while both groups demonstrated similar progress in HRQOL and distress. In the multivariate analysis, HOMA-IR (MPCOSQ-Body hair B -0.23 ; CI: $-0.42, -0.04$; $p=0.02$) and the change in Body-Mass-Index (MPCOSQ-Menstrual problems B: -0.20 ; CI: $-0.36, -0.04$; $p=0.02$) were associated with improvements in specific HRQOL subdomains. Group affiliation (M-group/C-group) was not associated with the outcomes in the regression model.

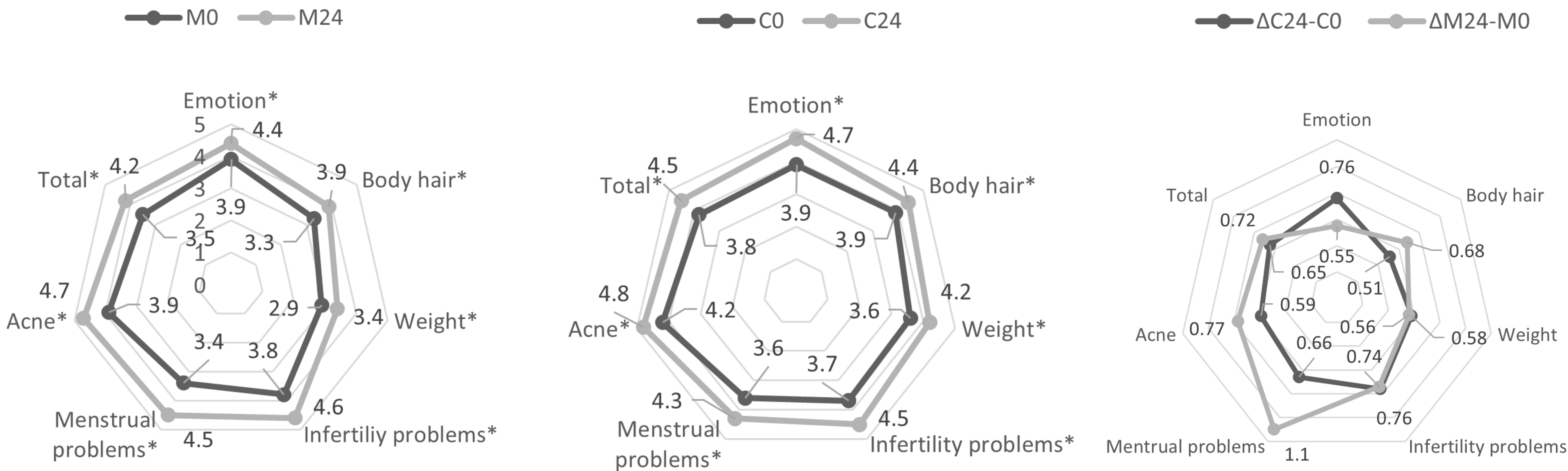


Fig. 1: Results of the two study collectives (M-group/C-group) at study inclusion and at the follow-up (t1) of the Modified PCOS-Questionnaire (MPCOSQ) and its subscales, as well as the delta of the development. Significant differences between the time points are marked with an asterisk. (C0: Comparison group not taking metformin, at t0; C1: Comparison group not taking metformin, at t1; M0: study group taking metformin, at t0; M1: study group taking metformin, at t1)

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