

THE IMPACT OF METFORMIN ON PSYCHOSOCIAL WELLBEING AFFECTING QUALITY OF LIFE AMONG MALAYSIAN WOMEN WITH POLYCYSTIC OVARIAN SYNDROME.

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ABSTRACT

Polycystic ovary syndrome (PCOS) is proven to cause a reduction in wellbeing and quality of life. The aim of this study was to monitor the impact of metformin on mental health issues of psychosocial wellbeing affecting the quality of life among Malaysian women with PCOS. A cross sectional study was carried out at the outpatient clinic of obstetrics and gynecology (OnG) department at 2 Hospitals for 4 months by convenient and purposive sampling where 100 patients were enrolled equally into without metformin group and with metformin group, based on their pharmacotherapy for their PCOS management. Validated instrument for this study consists from

combination of Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI-II), Rosenberg' Self-Esteem Scale (RSES), Liebowitz' Social Anxiety Scale (LSAS) and SF-36 Quality of Life Scale (SF-36), which was then handed out for comparison between the groups. Results indicated significant positive differences in the mean score of anxiety, depression, self-esteem, social anxiety and quality of life, of respondents in with metformin group. The changes in mean score was highest in Quality of Life (QoL), showing a higher score of 90.60 (17.60) in with metformin group compared to score of 80.40 (15.45) in without metformin group. The findings revealed that metformin had a positive impact in enhancing mental health issues of psychosocial wellbeing and quality of life among Malaysian women with PCOS.

KEYWORDS: Polycystic Ovarian Syndrome, Metformin, Psychosocial wellbeing, Quality of Life.

1) INTRODUCTION

Based on the joint International Pharmaceutical Federation (FIP) and World Health Organization (WHO) guidelines on good pharmacy practice; standards for quality of pharmacy services, it is emphasized that a predominant discipline of pharmacy which contributes to health improvement and to help patients with health problems to make the best use of their medicines is termed as pharmacy practice.^[1] The term pharmaceutical which is part of pharmacy practice is defined as the responsible provision of drug therapy by the collaboration of a clinical pharmacist with the patient and the other health care personnel's in designing, implementing and monitoring a therapeutic plan that will produce specific outcomes. Polycystic ovarian syndrome (PCOS) is a heterogeneous condition associated with metabolic syndrome-related or hormone-driven clinical symptoms which increases risk of developing other health complications. In current setting, metformin is commonly prescribed among PCOS women in accordance with evidence based assessment and its use is usually determined on a case-by-case basis in Malaysian PCOS patients.

Living with clinical symptoms of PCOS clearly has an impact on the patient overall wellbeing that will certainly be negatively affected not merely by physical but also by psychology and social factors as well affecting the quality of life (QoL). In-depth interviews even indicated that women with PCOS feel different, especially in regard to their femininity.^[2] These psychosocial wellbeing complications in terms of mental health issues such as anxiety, depression, self-esteem and social anxiety can be categorized as clinical disorders under Axis 1 diagnostic criteria based on the American Psychiatric Association (APA) guide, Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV).^[3] It is to be noted that in a study using metformin for PCOS, some interesting positive associations were observed between clinical treatment effects and psychosocial improvements. In accordance with pharmacy practice and pharmaceutical care, this study is framed. The study focuses on monitoring the impact metformin on mental health issues of psychosocial wellbeing which affects the QoL among Malaysian women with PCOS. The independent variable is the drug metformin. The dependent variables are the psychosocial wellbeing in terms of mental health issues of anxiety, depression, self-esteem and social anxiety and the QoL.

2) MATERIAL METHODS

2.1) Study location

This study was carried out in the outpatient clinic of obstetrics and gynecology (OnG) department at 2 Hospitals, Selangor after obtaining the ethical clearance from National Institute of Health (NIH) and Medical Research and Ethics committee (MREC), Ministry of Health Malaysia.

2.2) Study Population

The populations for this study are females aged 15 to 45 years old, diagnosed with PCOS according to the Rotterdam Criteria,^[5] prescribed without or with metformin as their PCOS pharmacotherapy and are attending the respective outpatient clinic of obstetrics and gynecology (OnG) department at Hospital Ampang and Hospital Serdang, Selangor. A total of 100 subjects were eligible for this research study.

2.3) Sampling Strategy

Samples were recruited using convenience and purposive sampling whereby participants were equally and selectively divided into two groups, which are without metformin group (70 patients) who are respondents not taking metformin as part of their pharmacotherapy for PCOS whereas with metformin group (70 patients) who are respondents taking metformin as part of their pharmacotherapy for PCOS. After enrollment, patient information sheet and consent form were given to the respondents. If respondent agrees to participate, only then the structured questionnaire was handed out. Verbal explanation was also provided to all the participants to facilitate the process.

2.4) Survey Instrument

Validated questionnaire for this study consists from combination of Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI-II), Rosenberg' Self-Esteem Scale (RSES), Liebowitz' Social Anxiety Scale (LSAS) and SF-36 Quality of Life Scale (SF-36) instruments, which was then handed out for comparison between the groups. Questionnaire also consists of a specified section to record the patient's demographic details. Data analysis was carried out by SPSS software.

3) RESULTS

Independent samples *t*-test was used to compare means of dependent variable with the independent variables. The results are as shown in Table 1.

Table 1: Comparison of means by scales between without metformin and with metformin groups.

No	Scale	Without Metformin (i) (n=50) Mean (SD)	With Metformin (j) (n=50) Mean (SD)	<i>t</i> value (i) - (j)(P value)
1.	Anxiety	57.49 (18.71)	49.57 (17.12)	2.2083 (0.0296)*
2.	Depression	55.64 (11.52)	50.14 (10.05)	2.5439 (0.0125)*
3.	Self esteem	20.33 (7.33)	18.36 (6.35)	1.4364 (0.1541)NS
4.	Social anxiety	50.70 (17.61)	44.74 (10.09)	2.0765 (0.0405)*
5.	Quality of Life	80.40 (15.45)	90.60 (17.60)	3.0797 (0.0027)*

Note: n: Sample size, *: Significant if $P < 0.05$, NS: Non significant if $P \text{ value} > 0.05$.

4) DISCUSSION

More than half of the respondents stated no to any family history of PCOS (86%) and more than half of them are also non-smokers and non-alcoholics (66%). No positive links was found between family history and social history of smoking and alcohol with the prevalence of PCOS. This can be interrelated with the respondent's race and religion. Malays who make up the majority of the Malaysian population at 50.4% are Islam in religion.^[6] Islam women are mostly non-smokers and non-alcoholics due to religion restrictions. Although the current research was not specifically designed to evaluate factors related to lifestyle and genetics, this results indicates that further research is in need to identify genetic and life style etiology among Malaysian women with PCOS. Although the percentage distribution of married individuals in Malaysia is higher than single individuals, in this study higher numbers of respondents are single (66%) when compared to married (29%) and divorcees (5%) respondents. The Malays make the largest group of women with PCOS at 57%, Chinese at 19%, Indians at 14% and other races at 10%. Indicates that single Malay women who are Islam in religion are more prevalent towards PCOS and the complications associated. These findings could differ geographically.^[7] Further investigation and experimentation on prevalence of PCOS and the complications among Malaysian women is strongly recommended. In the age range of the study, highest numbers of respondents are from 20-24 years old range (40%). In without metformin group, the 20-24 years olds also records highest number of respondents (48%). However in with metformin group, the 15-19 years olds records highest number of respondents (38%). The age group of 15-19 year olds can be categorized as adolescents.^[8] The study results show that, Malaysian adolescents are more inclined to be prescribed with metformin as part of the pharmacotherapy for PCOS management based on the clinical judgment of the medical practitioner and pharmacists. This

practice of considering metformin especially for adolescents is justified by numerous studies.^[9]

More than half respondents identified oligomenorrhea/amenorrhea (65%) as their chief complaint due to PCOS. Others identified symptoms such as infertility/first trimester miscarriage (17%), overweight/obesity (15%), acne (2%), hirsutism (1%) and none identified facing alopecia and acanthosis nigricans. According to the “Diagnosis and Treatment of Polycystic Ovary Syndrome: An Endocrine Society Clinical Practice Guideline”, metformin is beneficial for metabolic/glycemic abnormalities and for improving menstrual irregularities. It has limited or no benefit in treating hirsutism, acne, or infertility.^[10] This concurs with the study results where respondents who stated oligomenorrhea/amenorrhea and overweight/obesity are inclined to be in with metformin group unlike respondents who stated infertility/first trimester miscarriage as their chief complaint due to PCOS.

Of the total 50 respondents in with metformin group, current dose per day is 500mg-1000mg (38%), 1001-1500mg (28%), 1501-2000mg (20%) and 2001mg-2500mg (14%). If diet and exercise regimes are not effective and renal function is normal, metformin dose of 1500mg-2000mg should be prescribed and if effective the treatment is continued for 6 months to 1 year and if no effectiveness is seen, metformin should be ceased.^[11] Beneficial effects are lost soon after treatment is discontinued.^[12] This concurs with the study results where most respondents diagnosed with PCOS 1/12 to 1 year ago (66%), higher numbers of them are prescribed with metformin contrasting in case of respondents who are diagnosed from 1 year to 4 years ago. However, reliable data about how long the treatment should be continued to monitor effectiveness and long-term safety remain to be answered as it is not well-standardized in clinical practice.

Independent samples t-test was conducted to compare the differences of psychosocial wellbeing in terms of mental health issues such as anxiety, depression, self-esteem and social anxiety and the QoL between without metformin and with metformin groups. The change in mean score was highest in QoL, followed by the changes in anxiety, social anxiety, depression and finally self-esteem. The P value for anxiety is 0.0296, depression is 0.0125, self-esteem is 0.1541, social anxiety is 0.0405 and QoL is 0.0027. If the P value is < 0.05, then the differences is considered to be statistically significant. This result implies that except for self-esteem, significant differences in the anxiety, depression, social anxiety and QoL are

observed in comparison with both groups.^[13] It is concluded that in with metformin group, anxiety, depression, social anxiety and QoL is better compared to without metformin group.^[14] Odds ratio (OR) was used to compare the relative odds of the occurrence of the outcome of interest which is the QoL in PCOS diagnosed women, given exposure to the variable of interest which is the drug metformin in these respondents. The OR was calculated to be 5.4176. With metformin group QoL is 5.4176 times better than without metformin group QoL.^[15] In the conclusion, the present findings revealed that metformin has a positive impact in enhancing mental health issues of psychosocial wellbeing hence positively affecting the QoL of Malaysian women with PCOS.

5) CONCLUSION

The findings revealed that metformin had a positive impact in enhancing mental health issues of psychosocial wellbeing and quality of life among Malaysian women with PCOS.

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