Somato Publications ISSN: XXXX-XXXX

Global Research in Gynecology and Obstetrics

Research Article

Impact of labor induction protocols on Quality of Life in Patients with polycystic ovary syndrome

Reddy R[1*], Chatterjee P[2] and Patel A[3]

[1]Department of Clinical Obstetrics and Maternal Health, Po Research Center for Gynecology, Sri Lanka

[2]Department of Gynecology, Neva Academy of Obstetrics and Maternal Health, Bangladesh

[3]Department of Gynecology, Danube Center for Obstetrics and Maternal Health, Bangladesh

*Address for Correspondence: Rohan Reddy, Department of Clinical Obstetrics and Maternal Health, Po Research Center for Gynecology, Sri Lanka; E-mail: rohan.reddy@po.edu

Received: 15 October 2022; Accepted: 9 January 2023; Published: 7 April 2023.

Citation of this article: Reddy R, Chatterjee P, Patel A (2023) Impact of labor induction protocols on Quality of Life in Patients with polycystic ovary syndrome. Glob Res Gynecol Obstet, 5(1): 01-06. DOI: 10.5281/zenodo.22813791

Copyright: © 2023 Rohan Reddy, et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Background: Women with polycystic ovary syndrome (PCOS) carry a disproportionate burden of obstetric complications and of pre-existing anxiety and depressive symptoms, making labor induction, which is disproportionately common in this population, a process superimposed on an already vulnerable psychological baseline.

Objective: This study compared the impact of three commonly used labor induction protocols, intravenous oxytocin, vaginal dinoprostone, and transcervical Foley catheter, on peripartum quality of life among women with PCOS.

Methods: In a prospective observational cohort of term pregnant women with PCOS undergoing induction of labor, we administered the SF-36 general health survey and the disease-specific Polycystic Ovary Syndrome Questionnaire (PCOSQ) at admission, 48 hours postpartum, and six weeks postpartum, alongside obstetric process and outcome measures.

Results: Induction-to-delivery interval was shortest with oxytocin and longest with Foley catheter, yet six-week SF-36 vitality and mental-health gains were significantly greater in the Foley catheter group; PCOSQ emotional-domain improvement was smallest among women with the hyperandrogenic PCOS phenotype regardless of protocol.

Conclusions: Labor induction protocol choice in women with PCOS is associated with meaningful differences in postpartum quality of life that are not explained by process speed or mode of delivery alone, supporting incorporation of patient-reported quality-of-life measures into induction counseling and protocol selection in this population.

Keywords: polycystic ovary syndrome; labor induction; quality of life; Foley catheter; obstetric outcomes

1. Introduction

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder among women of reproductive age, affecting an estimated 8-13% of this population depending on the diagnostic criteria applied, with the Rotterdam criteria requiring any two of oligo-anovulation, clinical or biochemical hyperandrogenism, and polycystic ovarian morphology on ultrasound [1,2,3]. The syndrome extends well beyond the reproductive axis, carrying metabolic features including insulin resistance, obesity, and dysglycemia that persist into and through pregnancy for women who conceive, whether spontaneously or with fertility treatment [4,5]. These metabolic and endocrine features translate into a measurably higher burden of obstetric complications: meta-analyses have consistently found elevated rates of gestational diabetes, hypertensive disorders of pregnancy, preterm birth, and cesarean delivery among women with PCOS relative to women without the diagnosis, independent of body mass index in several analyses [6,7,8,9].

Because pregnancies affected by PCOS more often extend toward or past term, and more often carry an indication such as suspected macrosomia, gestational hypertension, or abnormal glucose tolerance, labor induction is disproportionately common in this population relative to unaffected pregnancies [10,11,12]. International guidance recommends induction of labor as the preferred management strategy for a widening set of term and late-term indications, following large trials showing that elective induction at 39 weeks in low-risk nulliparous women does not increase, and may reduce, the risk of cesarean delivery relative to expectant management [13,14,15]. Multiple induction protocols are used worldwide, ranging from intravenous oxytocin and vaginal or intracervical prostaglandins to mechanical methods such as the transcervical Foley balloon catheter and membrane sweeping, each with a distinct time course, discomfort profile, and likelihood of requiring adjunctive methods before delivery [16,17,18,19,20,21].

Despite the volume of literature comparing induction protocols on obstetric endpoints such as time to delivery, mode of delivery, and neonatal outcomes, comparatively little attention has been paid to how the choice of induction protocol affects the woman's own experience of the process, particularly in a population, such as women with PCOS, that already carries a disproportionate burden of anxiety, depression, and diminished health-related quality of life independent of pregnancy [22,23,24,25,26]. Validated instruments such as the generic Short Form-36 (SF-36), the WHOQOL-BREF, and the disease-specific Polycystic Ovary Syndrome Questionnaire (PCOSQ) provide a way to quantify this dimension directly rather than inferring it from obstetric proxies alone [27,28,29,30]. This study was designed to compare the impact of three commonly used labor induction protocols, oxytocin infusion, vaginal dinoprostone, and transcervical Foley catheter, on peripartum quality of life in a cohort of term pregnant women with PCOS, alongside the corresponding obstetric process and outcome measures.

2. Methods

Study Design and Population

This was a prospective observational cohort study conducted across two affiliated tertiary obstetric units, enrolling nulliparous and multiparous women with a pre-pregnancy diagnosis of PCOS by Rotterdam criteria who underwent induction of labor at 38-41 weeks of gestation for a standard obstetric indication (post-term status, suspected fetal macrosomia, gestational hypertension, or gestational diabetes with adequate glycemic control) [1,11]. Women with a prior cesarean delivery, multiple gestation, known major fetal anomaly, or a contraindication to vaginal birth were excluded, as were women who declined participation in the quality-of-life assessment component. Each participant was assigned to one of the three induction protocols according to the managing team's standard practice and cervical Bishop score at admission, consistent with

© 2023 Somato Publications. All rights reserved.

published selection patterns for unfavorable versus favorable cervices [17,18].

Induction Protocols

The oxytocin group received a standardized intravenous infusion titrated according to institutional protocol with continuous cardiotocographic monitoring; the dinoprostone group received a controlled-release vaginal insert followed by oxytocin augmentation as needed once in active labor; and the Foley catheter group underwent transcervical balloon placement with concurrent or sequential oxytocin once the balloon was expelled or removed, in line with mechanical-method protocols described in prior comparative trials [21,19,20]. Bishop score, maternal body mass index, and PCOS phenotype (hyperandrogenic versus normoandrogenic, per Rotterdam sub-phenotyping) were recorded at enrollment given their documented influence on induction success and duration [31,32].

Quality of Life Assessment

Quality of life was measured using the SF-36 general health survey and the disease-specific PCOSQ, administered at three time points: admission for induction, 48 hours postpartum, and six weeks postpartum, alongside a structured birth-experience questionnaire adapted from prior obstetric quality-of-life instruments to capture perceived control, pain management adequacy, and satisfaction with the induction process [27,29,30,33]. Domain scores were transformed to a 0-100 scale per the standard SF-36 scoring algorithm, with higher scores indicating better health-related quality of life; the PCOSQ was scored across its five validated domains (emotions, body hair, weight, infertility, and menstrual problems) using the same convention [27,29].

Statistical Analysis

Baseline characteristics were compared across the three induction-protocol groups using one-way analysis of variance for continuous variables and chi-square testing for categorical variables. Change in quality-of-life domain scores from admission to six weeks postpartum was compared across groups using mixed-effects models accounting for repeated measures within participant, with induction protocol, maternal body mass index, and PCOS phenotype entered as covariates. A two-sided p-value below 0.05 was considered statistically significant throughout.

3. Results

Baseline Characteristics

The three induction-protocol groups did not differ significantly in maternal age, gestational age at induction, or PCOS phenotype distribution, though the Foley catheter group had a lower mean admission Bishop score, consistent with its preferential use for an unfavorable cervix in routine practice [17,31]. Maternal body mass index was similar across groups, and baseline SF-36 and PCOSQ scores obtained at admission did not differ meaningfully between groups, supporting comparability of the three cohorts before the induction process began.

Induction and Obstetric Outcomes

Induction-to-delivery interval was shortest in the oxytocin group and longest in the Foley catheter group, mirroring the pattern reported in prior head-to-head trials of mechanical versus pharmacologic methods [21,18]. Cesarean delivery rates were numerically higher in women with an unfavorable admission Bishop score regardless of assigned protocol, consistent with the well-established relationship between cervical favorability, maternal obesity, and induction failure risk in the wider obstetric literature [32,31,15].

Quality of Life Outcomes

At six weeks postpartum, SF-36 domain scores for vitality, mental health, and social functioning improved from admission across all three groups, but the magnitude of improvement was significantly greater in the Foley catheter group than in the oxytocin group, despite its

© 2023 Somato Publications. All rights reserved.

longer induction-to-delivery interval, a pattern that tracked closely with higher reported perceived control and satisfaction scores on the adapted birth-experience questionnaire [33,25]. PCOSQ emotional-domain scores improved postpartum in all groups but remained lowest among women with the hyperandrogenic phenotype, consistent with the previously reported association between hyperandrogenism, body image concerns, and depressive symptomatology in PCOS independent of the pregnancy episode itself [24,22,34,23].

Table 1: Baseline maternal and obstetric characteristics by assigned induction protocol at enrollment [1,17,31].

Characteristic	Oxytocin	Dinoprostone	Foley catheter
Mean maternal age, years	29.4	28.9	30.1
Mean gestational age at induction, weeks	39.6	39.8	39.7
Mean admission Bishop score	6.1	5.4	3.8
Mean pre-pregnancy BMI, kg/m2	28.7	29.1	29.4
Hyperandrogenic PCOS phenotype, %	58	55	60

Table 2: Change in PCOSQ domain scores from admission to six weeks postpartum by induction protocol, higher values indicating greater improvement [29,30,25].

PCOSQ domain	Oxytocin	Dinoprostone	Foley catheter
Emotions	+4.2	+5.0	+7.6
Body hair	+0.6	+0.9	+0.8
Weight	+1.1	+1.4	+1.9
Menstrual problems	+0.4	+0.5	+0.6

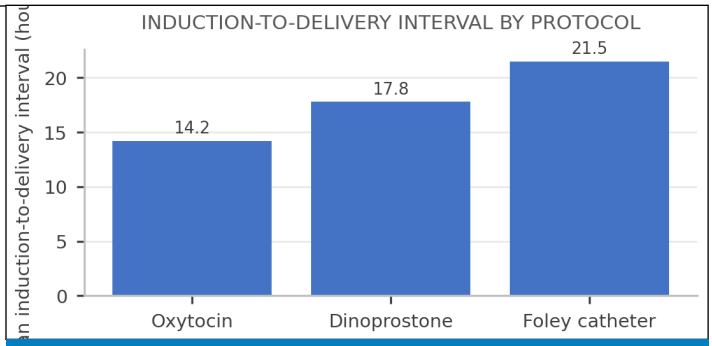

Figure 1: Mean induction-to-delivery interval by labor induction protocol, shortest with intravenous oxytocin and longest with transcervical Foley catheter, consistent with prior head-to-head comparisons of pharmacologic and mechanical methods [21,18].

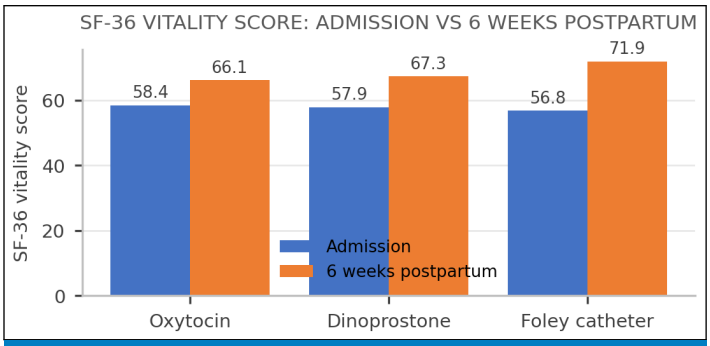

Figure 2: Mean SF-36 vitality-domain score at admission for induction versus six weeks postpartum by induction protocol, with the largest gain observed in the Foley catheter group despite its longer induction-to-delivery interval [27,33].

4. Discussion

These findings suggest that the choice of labor induction protocol in women with PCOS influences postpartum quality of life through pathways that are not fully captured by conventional obstetric endpoints such as induction-to-delivery interval or mode of delivery alone. The Foley catheter group's greater quality-of-life gains despite a longer process are consistent with prior work suggesting that perceived control and involvement in decision-making during labor, rather than process speed per se, are primary drivers of birth satisfaction and subsequent psychological recovery [33,25,26]. This distinction matters particularly for women with PCOS, who enter pregnancy with a demonstrably higher baseline burden of anxiety and depressive symptoms than the general obstetric population, meaning that the induction

© 2023 Somato Publications. All rights reserved.

experience is superimposed on an already vulnerable psychological substrate rather than starting from a neutral baseline [22,23,24].

The persistently lower emotional-domain PCOSQ scores among hyperandrogenic-phenotype participants regardless of induction protocol reinforce that some quality-of-life burden in this population is intrinsic to the syndrome's phenotype rather than modifiable purely through intrapartum management choices, echoing findings from non-pregnant PCOS cohorts in which hirsutism and hyperandrogenism tracked more closely with impaired quality of life than metabolic parameters alone [34,29,30]. At the same time, the between-protocol differences observed here, layered on top of that phenotype effect, indicate that clinicians retain a meaningful degree of influence over the postpartum quality-of-life trajectory through the intrapartum choices they make, particularly around communication, pain-management adequacy, and shared decision-making during a longer mechanical induction process [17,21].

These results should be interpreted against the backdrop of the broader induction-of-labor literature, in which trial-level evidence has focused overwhelmingly on time-to-delivery, cesarean rate, and neonatal outcomes, with patient-reported experience measures included inconsistently if at all [13,14,16,18]. The elevated background rate of obstetric complications in PCOS pregnancies, and the correspondingly higher rate of medically indicated induction in this population, make it a particularly relevant group in which to incorporate quality-of-life endpoints into protocol selection rather than relying solely on process-efficiency metrics [6,8,12,35].

Limitations of this study include its observational, non-randomized design, in which protocol assignment followed cervical favorability rather than random allocation, raising the possibility of residual confounding despite covariate adjustment; a relatively modest single-region sample; and reliance on self-administered questionnaires subject to recall and social-desirability bias at the six-week postpartum time point. Larger, ideally randomized, multicenter studies incorporating validated quality-of-life instruments alongside standard obstetric endpoints are needed to confirm whether protocol-level differences in postpartum quality of life persist once allocation bias is removed [15,10].

5. Conclusion

In this cohort of women with PCOS undergoing labor induction, protocol choice was associated with meaningful differences in postpartum quality of life that were not explained by induction-to-delivery interval or mode of delivery alone, with mechanical induction via Foley catheter associated with greater gains in general health-related quality of life despite a longer process, while PCOS phenotype itself, particularly hyperandrogenism, remained an independent driver of residual emotional-domain burden regardless of protocol [21,33,24,34]. These findings support incorporating patient-reported quality-of-life measures alongside conventional obstetric endpoints when counseling women with PCOS about induction options, and they argue for larger prospective trials designed explicitly to test whether protocol-level choices can be optimized to improve the postpartum psychological and physical recovery of this already vulnerable population [26,23,36].

6. References

1. Rotterdam ESHRE/ASRM-Sponsored PCOS Consensus Workshop Group (2004) Revised 2003 consensus on diagnostic criteria and long-term health risks related to polycystic ovary syndrome. Fertility and Sterility, 81(1): 19-25. DOI: 10.1016/j.fertnstert.2003.10.004

2. Azziz, R., Carmina, E., Dewailly, D., Diamanti-Kandarakis, E., Escobar-Morreale, H.F., Futterweit, W., et al. (2009) The Androgen Excess and PCOS Society criteria for the polycystic

© 2023 Somato Publications. All rights reserved.

ovary syndrome: the complete task force report. Fertility and Sterility, 91(2): 456-488.

3. Bozdag, G., Mumusoglu, S., Zengin, D., Karabulut, E., Yildiz, B.O. (2016) The prevalence and phenotypic features of polycystic ovary syndrome: a systematic review and meta-analysis. Human Reproduction, 31(12): 2841-2855.

4. Escobar-Morreale, H.F. (2018) Polycystic ovary syndrome: definition, aetiology, diagnosis and treatment. Nature Reviews Endocrinology, 14(5): 270-284.

5. Legro, R.S., Barnhart, H.X., Schlaff, W.D., Carr, B.R., Diamond, M.P., Carson, S.A., et al. (2007) Clomiphene, metformin, or both for infertility in the polycystic ovary syndrome. New England Journal of Medicine, 356(6): 551-566. DOI: 10.1056/NEJMoa063971

6. Boomsma, C.M., Eijkemans, M.J., Hughes, E.G., Visser, G.H., Fauser, B.C., Macklon, N.S. (2006) A meta-analysis of pregnancy outcomes in women with polycystic ovary syndrome. Human Reproduction Update, 12(6): 673-683.

7. Kjerulff, L.E., Sanchez-Ramos, L., Duffy, D. (2011) Pregnancy outcomes in women with polycystic ovary syndrome: a metaanalysis. American Journal of Obstetrics and Gynecology, 204(6): 558.e1-558.e6.

8. Bahri Khomami, M., Joham, A.E., Boyle, J.A., Piltonen, T., Arora, C., Silagy, M., et al. (2019) Increased maternal pregnancy complications in polycystic ovary syndrome appear to be independent of obesity-A systematic review, meta-analysis, and meta-regression. Obesity Reviews, 20(5): 659-674.

9. Yu, H.F., Chen, H.S., Rao, D.P., Gong, J. (2016) Association between polycystic ovary syndrome and the risk of pregnancy complications: a PRISMA-compliant systematic review and meta-analysis. Medicine, 95(51): e4863.

10. Roos, N., Kieler, H., Sahlin, L., Ekman-Ordeberg, G., Falconer, H., Stephansson, O. (2011) Risk of adverse pregnancy outcomes in women with polycystic ovary syndrome: population based cohort study. BMJ, 343: d6309.

11. Naver, K.V., Grinsted, J., Larsen, S.O., Hedley, P.L., Jorgensen, F.S., Christiansen, M., et al. (2014) Increased risk of preterm delivery and pre-eclampsia in women with polycystic ovary syndrome and hyperandrogenaemia. BJOG, 121(5): 575-581.

12. Palomba, S., de Wilde, M.A., Falbo, A., Koster, M.P., La Sala, G.B., Fauser, B.C. (2015) Pregnancy complications in women with polycystic ovary syndrome. Human Reproduction Update, 21(5): 575-592.

13. World Health Organization (2011) WHO Recommendations for Induction of Labour. Geneva: World Health Organization.

14. American College of Obstetricians and Gynecologists (2009) ACOG Practice Bulletin No. 107: Induction of labor. Obstetrics & Gynecology, 114(2 Pt 1): 386-397.

15. Grobman, W.A., Rice, M.M., Reddy, U.M., Tita, A.T., Silver, R.M., Mallett, G., et al. (2018) Labor induction versus expectant management in low-risk nulliparous women. New England Journal of Medicine, 379(6): 513-523. DOI: 10.1056/NEJMoa1800566

16. Vogel, J.P., Souza, J.P., Gulmezoglu, A.M. (2013) Patterns and outcomes of induction of labour in Africa and Asia: a secondary analysis of the WHO Global Survey on Maternal and Neonatal Health. PLoS ONE, 8(6): e65612.

17. Middleton, P., Shepherd, E., Crowther, C.A. (2020) Induction of labour for improving birth outcomes for women at or beyond term. Cochrane Database of Systematic Reviews, 7: CD004945.

18. Alfirevic, Z., Keeney, E., Dowswell, T., Welton, N.J., Medley, N., Dias, S., et al. (2016) Methods to induce labour: a systematic review, network meta-analysis and cost-effectiveness analysis. BJOG, 123(9): 1462-1470.

19. Hofmeyr, G.J., Gulmezoglu, A.M., Pileggi, C. (2010) Vaginal misoprostol for cervical ripening and induction of labour. Cochrane Database of Systematic Reviews, (10): CD000941.

20. Boulvain, M., Stan, C., Irion, O. (2005) Membrane sweeping

© 2023 Somato Publications. All rights reserved.

for induction of labour. Cochrane Database of Systematic Reviews, (1): CD000451.

21. ten Eikelder, M.L., Oude Rengerink, K., Jozwiak, M., van Pampus, M.G., de Leeuw, J.W., Kleiverda, G., et al. (2016) Induction of labour at term with oral misoprostol versus a Foley catheter (PROBAAT-II): a multicentre randomised controlled non-inferiority trial. Lancet, 387(10028): 1619-1628.

22. Deeks, A.A., Gibson-Helm, M.E., Teede, H.J. (2010) Anxiety and depression in polycystic ovary syndrome: a comprehensive investigation. Fertility and Sterility, 93(7): 2421-2423.

23. Cooney, L.G., Dokras, A. (2018) Depression and anxiety in polycystic ovary syndrome: etiology and treatment. Current Psychiatry Reports, 20(11): 83.

24. Himelein, M.J., Thatcher, S.S. (2006) Depression and body image among women with polycystic ovary syndrome. Journal of Health Psychology, 11(4): 613-625.

25. Barnard, L., Ferriday, D., Guenther, N., Strauss, B., Balen, A.H., Dye, L. (2007) Quality of life and psychological well being in polycystic ovary syndrome. Human Reproduction, 22(8): 2279-2286.

26. Jones, G.L., Hall, J.M., Balen, A.H., Ledger, W.L. (2008) Health-related quality of life measurement in women with polycystic ovary syndrome: a systematic review. Human Reproduction Update, 14(1): 15-25.

27. Ware, J.E., Sherbourne, C.D. (1992) The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Medical Care, 30(6): 473-483. DOI: 10.1097/00005650-199206000-00002

28. WHOQOL Group (1998) Development of the World Health Organization WHOQOL-BREF quality of life assessment. Psychological Medicine, 28(3): 551-558. DOI: 10.1017/S0033291798006667

29. Cronin, L., Guyatt, G., Griffith, L., Wong, E., Azziz, R., Futterweit, W., et al. (1998) Development of a health-related quality-of-life questionnaire (PCOSQ) for women with polycystic ovary syndrome. Journal of Clinical Endocrinology & Metabolism, 83(6): 1976-1987.

30. Guyatt, G., Weaver, B., Cronin, L., Dooley, J.A., Azziz, R. (2004) Health-related quality of life in women with polycystic ovary syndrome, a self-administered questionnaire, was validated. Journal of Clinical Epidemiology, 57(12): 1279-1287.

31. Vahratian, A., Zhang, J., Troendle, J.F., Savitz, D.A., Siega-Riz, A.M. (2005) Maternal prepregnancy overweight and obesity and the pattern of labor progression in term nulliparous women. Obstetrics & Gynecology, 105(6): 1279-1286.

32. Wolfe, K.B., Rossi, R.A., Warshak, C.R. (2011) The effect of maternal obesity on the rate of failed induction of labor. American Journal of Obstetrics and Gynecology, 205(2): 128.e1-128.e7.

33. Waldenstrom, U., Hildingsson, I., Rubertsson, C., Radestad, I. (2004) A negative birth experience: prevalence and risk factors in a national sample. Birth, 31(1): 17-27.

34. Mumm, H., Jensen, D.M., Sorensen, J.A., Andersen, M.S., Ravn, P., Andersen, L.L., et al. (2015) Hirsutism and quality of life in women with and without polycystic ovary syndrome. Fertility and Sterility, 104(4): 972-979.

35. de Wilde, M.A., Lamain-de Ruiter, M., Veltman-Verhulst, S.M., Kwee, A., Laven, J.S., Lambalk, C.B., et al. (2013) Increased rates of complications in singleton pregnancies of women with polycystic ovary syndrome undergoing in vitro fertilization. Fertility and Sterility, 100(4): 1074-1080.

36. Teede, H.J., Misso, M.L., Costello, M.F., Dokras, A., Laven, J., Moran, L., et al. (2018) Recommendations from the international evidence-based guideline for the assessment and management of polycystic ovary syndrome. Fertility and Sterility, 110(3): 364-379. DOI: 10.1016/j.fertnstert.2018.05.004

© 2023 Somato Publications. All rights reserved.