

Clinical and Lipid Profiles of Patients on Hormonal Contraceptives: Insights from a Family Planning Clinic in Ilorin, Nigeria

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Abstract

Introduction: The efficacy and safety of hormonal contraception is essential for promoting reproductive and family health. Understanding the effect of hormonal contraceptives on patients' well-being and contraceptive preference is crucial in promoting acceptance and adherence to contraception.

Methods: A cross-sectional study was conducted among 261 participants accessing reproductive healthcare services at the clinic. Data on socio-demographic characteristics, lipid profiles, clinical parameters, obstetric history, and contraceptive preferences were collected and analyzed using descriptive statistics, percentages and chi-square tests

Results: Almost all of the study population were married (98.9%) and of Yoruba ethnicity (97.7%), the age category of 31-35 years constituted about one-third (29.9%) of the study population. A majority had secondary education (41.8%). About 37 (14%) of the women had a high-risk atherogenic index while the majority of the women were of low to intermediate-risk atherogenic index. The blood pressure was significantly higher among patients on implants and combined oral contraceptives. Depo-Provera (47.5%) was the predominant hormonal contraceptive among the participants.

Conclusions: This study showed the variations in the atherogenic index, systolic and diastolic blood pressures of the study participants which are possible risk factors for cardiovascular events. Reproductive healthcare providers should monitor patients on hormonal contraceptives to prevent the occurrence of such cardiovascular events.

Keywords: Lipid profile, Hormonal contraceptive, Clinic, Family planning, Nigeria

1. Introduction

The utilization of hormonal contraceptives remains a pivotal component of reproductive healthcare strategies, offering women autonomy over their fertility choices and enabling family planning. In Nigeria, where maternal and child health indicators continue to be challenging, access to

effective contraception is crucial to reducing unintended pregnancies and maternal mortality, while also promoting women's well-being. Despite efforts to improve contraceptive access and utilization, disparities persist, influenced by socio-demographic factors, cultural norms, and healthcare system challenges¹.

Socio-demographic characteristics, age, education, marital status, occupation, ethnicity, religion, and income level are

key determinants influencing contraceptive decision-making². Understanding these factors is essential for designing tailored interventions to enhance contraceptive access and uptake among diverse population groups³.

Moreover, the clinical implications of hormonal contraceptive use extend beyond pregnancy prevention, impacting women's health outcomes, including lipid profiles, cardiovascular health, and metabolic parameters. While hormonal contraceptives are generally safe and effective, their potential impact on lipid metabolism and cardiovascular risk factors necessitates thorough assessment and monitoring⁴. Variations in lipid profiles and clinical parameters among contraceptive users may highlight potential health implications and inform targeted healthcare interventions⁵. Obstetric history, including age at menarche, age at first delivery, number of children, and marital age, may influence contraceptive preferences and utilization patterns among women⁶. Understanding the interplay between obstetric history and contraceptive selection is vital for optimizing family planning services and addressing the unique reproductive health needs of women at different life stages⁷.

Furthermore, exploring the duration of hormonal contraceptive use and contraceptive preferences can impact women's health outcomes and contraceptive continuation rates. Long-term use of hormonal contraceptives may influence lipid profiles, cardiovascular risk factors, and metabolic parameters, necessitating regular monitoring and assessment^{8,9}. Despite the growing body of literature on hormonal contraceptive use, there remains a dearth of research focusing on the socio-demographic determinants, clinical implications, obstetric history, and duration of use among Nigerian women. Addressing this research gap is essential for developing evidence-based interventions, enhancing contraceptive services, and improving reproductive health outcomes in Nigeria. Thus, this study aims to investigate the socio-demographic characteristics, lipid profiles, clinical parameters, obstetric history, and duration of hormonal contraceptive use among women attending the family planning clinic at the University of Ilorin Teaching Hospital (UITH), Kwara State, Nigeria.

2. Method

2.1 Study Design: It is a hospital-based cross-sectional study design

2.2 Study Area: The study was conducted at the family planning clinic of UITH. The clinic operates under the Obstetrics and Gynaecology department, providing contraceptive services to women predominantly from Ilorin and its environs.

2.3 Study Population: The study population comprised women receiving hormonal contraceptives attending the family planning clinic of UITH who met the inclusion criteria and provided informed consent.

2.4 Sample Size Determination: The sample size was calculated using Fisher's statistical formula¹⁰ for descriptive health studies, considering a 95% confidence level and an estimated proportion of hormonal contraceptive users among women attending family planning clinics in Ilorin. A total of 261 participants were determined, taking into account the hospital's annual contraceptive clinic attendance and applying a correction factor for populations less than 10,000.

2.5 Sampling Method: Systematic random sampling¹¹ was employed to recruit participants. With an estimated 484 women expected to attend the clinic over the study period, the sampling interval was calculated to be approximately 2. Participants were selected every third individual after initial random selection, with replacement if necessary.

2.5.1 Inclusion Criteria: females of reproductive age (18-49 years), women on hormonal contraceptives for a minimum of 6 months.

2.5.2 Exclusion Criteria: women who were ill or too weak to participate, individuals with known hypertension or dyslipidemia before starting hormonal contraceptives, smokers or those on non-steroidal anti-inflammatory drugs, patients with diabetes mellitus, liver disease, cardiovascular disease, renal disease, or heart disease.

Data were collected using semi-structured questionnaires, physical examination tools (e.g., mercury sphygmomanometer, weighing scale, stadiometer), and laboratory equipment for lipid profile and hemogram assessments. The lipid profiles included LDL, HDL, TC, TG and atherogenic index was calculated using Castelli risk index I (division of the serum concentration of TC by the concentration of HDL)¹². Hospital records were also accessed for relevant medical history.

2.5.3 Informed Consent: Prospective participants provided verbal and written informed consent after being informed about the study's purpose, procedures, and potential risks. Consent forms were used to document participants' agreement to participate.

2.5.4 Questionnaire: A semi-structured interviewer-administered questionnaire was used to collect socio-demographic data, clinical profiles, contraceptive usage details, obstetric history, and adverse effects experienced by participants. Questionnaires were serially numbered to ensure anonymity.

2.5.5 Physical Examination: Anthropometric measurements (weight, height, body mass index) and blood pressure assessments were conducted using standardized techniques and equipment.

2.5.6 Laboratory Investigations: Blood samples were collected for lipid profile analysis and hemogram assessments. Laboratory procedures followed standardized protocols, and measurements were performed using automated clinical chemistry and specific protein analyzers.

2.6 Data Analysis: Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize socio-demographic characteristics, clinical parameters, and contraceptive preferences. Chi-square tests were employed to assess associations between categorical variables, while logistic regression analysis was conducted to explore predictors of contraceptive preferences. Statistical significance was set at $p < 0.05$.

2.7 Ethical Considerations: Ethical approval was obtained from the Ethics and Research Committee of the University of Ilorin Teaching Hospital. Informed consent was obtained from all participants before data collection, ensuring voluntary participation and confidentiality of information.

3. Result

Socio-demographic Characteristics of Respondents

Table 1 summarizes the socio-demographic characteristics of the 261 participants included in the study. The data provided insights into the socio-demographic composition of the study population. The majority of the participants were within the age group of 31-35 years, constituting 29.9% of the total sample, followed by those aged 36-40 years (23.4%) and 26-30 years (22.6%). The mean age of the participants was 34.8 years, with a standard deviation of 6.5 years. A significant proportion of the participants had completed secondary education (41.8%), followed by those with primary education (33.7%). A smaller proportion had no formal education (19.5%), while only 5.0% had tertiary education.

Marital status indicated that the vast majority of respondents were married (98.9%), with only a negligible proportion being single (1.1%). Most participants were traders (84.7%), while smaller percentages were engaged in farming (4.2%), civil service (4.2%), artisan work (1.1%), or reported being unemployed or full-time housewives (5.8%). Ethnically, the majority of respondents belonged to the Yoruba tribe (97.7%), with smaller percentages representing the Igbo (0.8%) and other ethnic groups (1.5%).

Table 1: Socio-demographic characteristics of respondents (N=261)

Variables	Frequency	Percentage
Age groups		
≤ 25	16	6.1
26 – 30	59	22.6
31 – 35	78	29.9
36 – 40	61	23.4
≥ 41	47	18.0
Mean ± SD	34.8 ± 6.5	
Level of Education		
Uneducated	51	19.5
Primary	88	33.7
Secondary	109	41.8
Tertiary	13	5.0
Marital Status		
Single	3	1.1
Married	258	98.9
Occupation		
Farming	11	4.2
Trading	221	84.7
Civil servant	11	4.2
Artisan	3	1.1
Unemployed/Full-time housewives	15	5.8
Tribe		
Yoruba	255	97.7
Igbo	2	0.8
Others	4	1.5
Religion		
Islam	215	82.4
Christianity	46	17.6
Income^a		
≤ 18000	84	32.2
> 18000	177	67.8

Keys: SD, standard deviation; ^a, The cut-off of eighteen thousand naira per month was based on the national minimum wage.

Lipid Profile and haemogram of study participants

A small percentage of respondents had values within the normal range for low-density lipoprotein (LDL), high-density lipoprotein (HDL), and total cholesterol. Specifically, 9.2% of participants had LDL values within the normal range, while even fewer had HDL (3.1%) and total cholesterol (4.2%) within the normal range. The majority of respondents had abnormal values for LDL (90.8%), HDL (96.9%), and total cholesterol (95.8%). (Table 2).

Table 2: Lipid profile and Haemogram of the study participants

Variables	Normal (%)	Abnormal (%)
LDL	24 (9.2)	237 (90.8)
HDL	8 (3.1)	253 (96.9)
Total Cholesterol	11 (4.2)	250 (95.8)
Triglyceride	117 (44.8)	144 (55.2)
PCV	235 (90.0)	26 (10.0)
Platelets	177 (67.8)	84 (32.2)

Keys: LDL, low-density lipoprotein; HDL, high density lipoprotein; PCV, pack cell volume

Atherogenic Index

The majority of respondents (62.0%) were classified as having a low-risk atherogenic index, 24.0% of participants had an intermediate risk, and 14.0% exhibited a high-risk atherogenic index. (Figure 1)

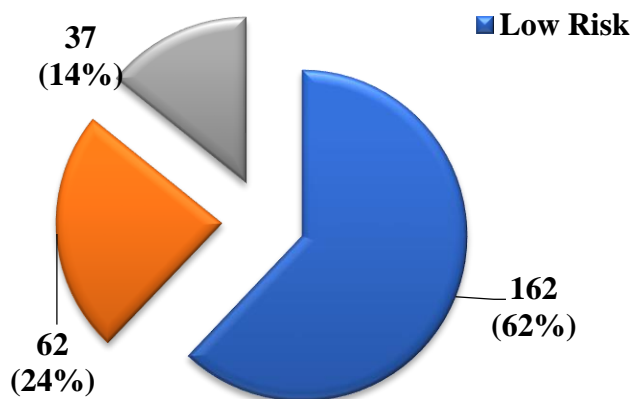


Figure 1: Atherogenic index of study participants

Clinical and Lipid Profiles of the participants in relation to the type of hormonal contraceptives

The most commonly utilized hormonal contraceptives among the participants were Depo-Provera (47.5%) and Noristerat (35.2%). Implants were used by 13.0% of the participants. The total cholesterol, triglycerides, high and low density lipoproteins were higher in patient on COC compared to other hormonal contraceptives though not statistically significant. (Table 3)

Systolic blood pressure (SBP) was significantly higher among respondents using implants compared to those using other contraceptives ($p=0.009$). Similarly, a statistically significant difference was observed in diastolic blood pressure (DBP) among users of combined oral contraceptives (COC) compared to other contraceptive types ($p=0.006$). (Table 3).

Table 3: Comparison of the Clinical and lipid profiles of the respondents in relation to the type of hormonal contraceptives

Table 3: Comparison of the Clinical and lipid profiles of the respondents in relation to the type of hormonal contraceptives

Variables	COC N=11	Depo-Provera N=124	Noristerat N=92	Implant N=34	P-value
SBP	116.36±15.01	112.48±12.92	110.43±12.12	119.12±15.04	0.009*
DBP	78.18±8.74	73.31±9.60	72.00±9.23	77.94±9.46	0.006*
BMI	22.56±3.49	22.76±3.94	22.23±3.95	21.05±3.79	0.155
Total cholesterol	3.53±0.80	3.19±0.79	3.26±0.88	3.28±0.79	0.622
Triglyceride	2.72±2.82	1.87±1.27	1.91±1.22	2.06±1.54	0.257
HDL	1.59±0.47	1.44±0.35	1.48±0.38	1.49±0.35	0.523
LDL	2.71±0.65	2.52±0.51	2.68±0.77	2.47±0.49	0.210
PCV	37.70±6.83	37.38±8.84	36.45±8.42	40.00±9.95	0.255
Platelet count	202,545±78,405	185,796±84,521	185,949±75,943	162,277±86,124	0.381
Atherogenic index	0.15±0.28	0.06±0.20	0.07±0.19	0.08±0.22	0.662

Keys: *, statistically significant; COC, combined oral contraceptive; SBP, systolic blood pressure; DBP, diastolic blood pressure; BMI, body mass index; HDL, high-density lipoprotein; LDL, low-density lipoprotein; PCV, pack cell volume.

Table 4: Relationship between clinical parameters and types of hormonal contraceptives used by study participants

Clinical profile	Hormonal contraceptives (%)				P-value
	Combined oral contraceptive	Depo-Provera	Noristerat	Implant	
Blood pressure					0.188
Normal	8 (3.5)	111 (48.0)	84 (36.4)	28 (12.1)	
Abnormal	3 (10.0)	13 (43.3)	8 (26.7)	6 (20.0)	
BMI					0.894 ^y
Underweight	2 (5.4)	12 (32.4)	16 (43.2)	7 (19.0)	
Normal	7 (4.1)	84 (49.7)	55 (32.5)	23 (13.6)	
Overweight	2 (4.1)	24 (49.0)	19(38.8)	4 (8.2)	
Obese	0 (0.0)	4(66.7)	2(33.3)	0 (0.0)	

Keys: BMI, body mass index, ^y= Yates corrected p-value

Table 5: Association between socio-demographic characteristics and type of hormonal contraceptives used by respondents

Variables	Hormonal contraceptives (%)				P-value
	COC	Depo-Provera	Noristerat	Implant	
Age groups					0.206
≤ 25	0 (0.0)	3 (18.8)	8 (50.0)	5 (31.2)	
26 – 30	1 (1.7)	29 (49.1)	20 (33.9)	9 (15.3)	
31 – 35	4 (5.1)	35 (44.9)	29 (37.2)	10 (12.8)	
36 – 40	4 (6.6)	36 (59.0)	16 (26.2)	5 (8.2)	
≥ 41	2 (4.3)	21 (44.7)	19 (40.4)	5 (10.6)	
Level of Education					0.749
Uneducated	0 (0.0)	24 (47.1)	20 (39.2)	7 (13.7)	
Primary	4 (4.5)	44 (50.0)	28 (31.9)	12 (13.6)	
Secondary	6 (5.5)	50 (45.8)	38 (34.9)	15 (13.8)	
Tertiary	1 (7.6)	6 (46.2)	6 (46.2)	0 (0.0)	
Marital Status					0.134
Single	0 (0.0)	0 (0.0)	3 (100.0)	0 (0.0)	
Married	11 (4.3)	124 (48.0)	89 (34.5)	34 (13.2)	
Occupation					0.764 ^y
Farming	0 (0.0)	5 (29.4)	6 (35.3)	6 (35.3)	
Trading	10 (4.5)	105 (47.5)	73 (33.0)	33 (15.0)	
Civil servant	1 (9.0)	5 (45.5)	5 (45.5)	0 (0.0)	
Artisan/Unemployed/Full-time housewives	0 (0.0)	9 (56.3)	8 (37.5)	1 (6.2)	
Tribe					0.341 ^y
Yoruba	11 (4.3)	118 (46.3)	92 (36.1)	34 (13.3)	
Others	0 (0.0)	6 (100.0)	0 (0.0)	0 (0.0)	
Religion					0.302
Islam	7 (3.3)	101 (47.0)	77 (35.7)	30 (14.0)	
Christianity	4 (8.7)	23 (50.0)	15 (32.6)	4 (8.7)	
Income					0.753
≤ 18000	3 (3.6)	44 (52.4)	27 (32.1)	10 (11.9)	
> 18000	8 (4.5)	80 (45.2)	65 (36.7)	24 (13.6)	

Keys: COC, combined oral contraceptive; ^y=Yates corrected p-values.

Table 6: Relationship between obstetric history and type of hormonal contraceptives

History	Hormonal contraceptives (%)				P-value
	COC	Depo-provera	Noristerat	Implant	
Menarche age					0.311
≤ 12	5 (6.8)	36 (48.6)	27 (36.5)	6 (8.1)	
> 12	6 (3.2)	88 (47.1)	65 (34.7)	28 (15.0)	
Marriage age					0.198
≤ 17	0 (0.0)	2 (28.6)	5 (71.4)	0 (0.0)	
> 17	11 (4.4)	122 (48.6)	84 (33.5)	34 (13.5)	
Age at first delivery					0.682
≤ 18	0 (0.0)	1 (33.3)	2 (66.7)	0 (0.0)	
> 18	11 (4.3)	123 (47.7)	90 (34.9)	34 (13.2)	
Number of children					0.081
≤ 4	9 (5.4)	70 (41.9)	63 (37.7)	25 (15.0)	
> 4	2 (2.1)	54 (57.4)	29 (30.9)	9 (9.6)	

Key: COC, combined oral contraceptive

Table 7: Association between duration of hormonal contraception use and types of hormonal contraception

Duration of hormone use (Years)	Types of hormonal contraceptives			
	COCs	Depo-Provera	Noristerat	Implant
≤ 2	3 (3.0)	43 (43.4)	40 (40.4)	13 (13.2)
> 2	8 (4.9)	81 (50.0)	52 (32.1)	21 (13.0)
Total	11 (4.2)	124 (47.6)	92 (35.2)	34 (13.0)

Keys: COC, combined oral contraceptive.

Note: $\chi^2=2.292$, $P=0.514$.

Association between Socio-demographic characteristics and types of hormonal Contraceptives

The variables examined include age groups, level of education, marital status, occupation, tribe, religion, and income. The distribution of respondents across different age groups did not significantly influence the choice of hormonal contraceptives. Similarly, there was no significant association between the level of education and the type of contraceptive used. Marital status also did not show a significant relationship with contraceptive choice, indicating that being married or single did not influence the selection of hormonal contraceptives. (Table 4).

Relationship between obstetric history and types of hormonal contraceptives

Regarding menarche age, both groups—those who experienced menarche at or below 12 years and those who experienced it above 12 years—did not show a significant preference for any particular type of contraceptive. The age at first delivery also did not exhibit a significant relationship with contraceptive choice. Whether respondents had their first delivery at or below 18 years or above 18 years did not impact their preference for a specific type of hormonal contraceptive. Furthermore, the number of children a respondent had did not significantly affect their choice of contraceptive. Both groups—those with four or fewer children and those with more than four children—did not show a preference for a particular type of contraceptive. (Table 5).

Association between duration of hormonal contraception use and types of hormonal contraceptives

Half of the respondents who used Depo-Provera had been using it for over two years, this association was not found to be statistically significant ($\chi^2=2.292$, $p=0.514$). Similarly, for

Noristerat and Implant users, the duration of use did not significantly influence the type of contraceptive chosen.

Among respondents using Depo-Provera, 43.4% reported using it for two years or less, while 50.0% reported using it for more than two years. For Noristerat users, 40.4% reported using it for two years or less, and 32.1% reported using it for more than two years. Among Implant users, 13.2% reported using it for two years or less, while 13.0% reported using it for more than two years. (Table 6)

4. Discussion

This study aimed at investigating the clinical characteristics, lipid profiles, and contraceptive preferences among patients attending the family planning clinic at the University of Ilorin Teaching Hospital, Kwara State, Nigeria. Contrary to conventional expectations, our findings suggest that factors such as age, education, marital status, occupation, ethnicity, religion, and income did not significantly influence the types of hormonal contraceptives chosen by respondents¹³. This observation challenges prevailing assumptions about the determinants of contraceptive decision-making and underscores the need for tailored counselling approaches that account for individual preferences and concerns¹⁴. Traditional approaches to contraceptive counselling often emphasize socio-demographic factors as key determinants of contraceptive preferences¹⁵. However, our findings suggest that a one-size-fits-all approach may not adequately address the diverse needs and preferences of women seeking contraceptive care. Instead, healthcare providers should adopt patient-centred counselling strategies that prioritize individual preferences, values, and reproductive goals¹⁶. By engaging women in shared decision-making processes and offering comprehensive information about available contraceptive options, providers can empower women to make informed

choices that align with their unique circumstances and preferences^{17, 18}.

The clinical and lipid profiles of study participants utilizing different hormonal contraceptives shed light on the potential associations between contraceptive use and metabolic health outcomes. In this study, there were notable variations among contraceptive groups such as in the SBP and DBP. Specifically, users of implants exhibited significantly higher SBP compared to users of other contraceptives, while users of combined oral contraceptives (COC) demonstrated distinct patterns of DBP compared to other contraceptive groups. The observed associations between contraceptive type and blood pressure measurements highlight the importance of considering individual patient characteristics and risk factors when prescribing contraceptives^{19, 20}. This study also showed that the total cholesterol, triglycerides, high and low density lipoproteins were higher in patient on COC compared to other hormonal contraceptives though it was not statistically significant but could be a risk for future cardiovascular event²¹. Healthcare providers should be vigilant in monitoring blood pressure and metabolic parameters in women using hormonal contraceptives, particularly those at increased risk of hypertension and cardiovascular disease²¹. There is also a need for comprehensive contraceptive counseling that takes into account potential metabolic effects associated with different contraceptive types. By informing patients about the potential risks and benefits of various contraceptive options, healthcare providers can empower women to make informed decisions about their reproductive health while minimizing adverse outcomes²²⁻²⁵.

Healthcare providers should recognize that women's contraceptive preferences are influenced by a myriad of factors beyond their obstetric history, including personal values, lifestyle considerations, and access to healthcare services²⁶⁻²⁸. Comprehensive reproductive health programs should therefore prioritize strategies aimed at addressing these underlying determinants to promote equitable access to contraception and improve reproductive health outcomes for all women²⁹⁻³².

5. Conclusion

This study highlighted the importance of continuous monitoring of the clinical and lipid profiles of patients using hormonal contraceptives to mitigate potential cardiovascular events. Future research should endeavour to elucidate the long-term health outcomes associated with the use of different hormonal contraceptives, thereby informing evidence-based strategies to optimize contraceptive care and promote reproductive health.

Limitation

The study was not multi-center, conducted only in the family planning clinic of University of Ilorin Teaching Hospital and thus findings cannot be generalized over the other teaching hospitals in the country.

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