

Hormonal Contraception and Hypertension at the Department of Obstetrics and Gynecology, Yalgado Ouédraogo Teaching Hospital: Epidemiological, Clinical and Therapeutic Patterns

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Received 21 April 2016; accepted 22 May 2016; published 25 May 2016

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Abstract

Context: The use of hormonal contraceptives could lead to a rise in blood pressure with an onset of hypertension. The objective of the study was to describe the epidemiological, clinical and therapeutic patterns of hypertension occurring in women on hormonal contraception. Patients and Methods: A retrospective study was carried out over a period of 5 years. It involved clients on hormonal contraception who developed hypertension during follow-up at the Family Planning Unit of the Yalgado Ouedraogo Teaching Hospital in Burkina Faso. Results: The global frequency of hypertension in clients on hormonal contraception was 1.8%; it varied depending on the type of methods of contraception used; it was 4.2% for clients on oral combined pills, 1% for implant users and 0.97% for women on injectable. The mean age of patients was 35.6 ± 8.4 years. Sixty-seven patients (84.8%) had mild to moderate hypertension. The mean time to onset of hypertension was

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How to cite this paper: Zamané, H., Millogo, G., Ouédraogo, C.M., Sawadogo, Y.A., Nongkouni, E., Kiemtoré, S., Kaïn, D.P., Kambiré, Y. and Lankoandé, J. (2016) Hormonal Contraception and Hypertension at the Department of Obstetrics and Gynecology, Yalgado Ouédraogo Teaching Hospital: Epidemiological, Clinical and Therapeutic Patterns. *Open Journal of Obstetrics and Gynecology*, 6, 379-384. <http://dx.doi.org/10.4236/ojog.2016.66049>

respectively seventeen (17), thirty six (36) and thirty eight (38) months for patients on OCPs, CIP, and implants. After the discovery of hypertension, the contraception methods have been changed in 75.9% of cases, stopped in 5.2% of cases and the same contraception method was continued in 8.9% of cases. None of the patients who continued the same contraceptive method had obtained a normalization of blood pressure. Blood pressure was normalized in 48.6% of patients who have changed contraceptive methods. The average time of normalization of the blood pressure varied from three to five months, depending on the method that induces the hypertension. Conclusion: Hypertension on hormonal contraception is not uncommon. It is important to assess the risk factors for its occurrence at the initiation of contraception.

Keywords

Hormonal Contraception, Hypertension, Ouagadougou

1. Background

High blood pressure (hypertension) represents the first group nosologic cardiovascular pathologies. It presents in two etiological forms: primary or essential hypertension and secondary hypertension (5% - 10%) [1]. In this latter form the increase in blood pressure may be due to several pathologies, like pregnancy or taking certain toxins or drugs like hormonal contraceptive [1] [2]. The influence of hormonal contraceptives on blood pressure (BP) is a function of the dose of estrogen (ethinyl estradiol), nature and dose of the progestin as well as the duration of use [2] [3]. However the increase in BP under the effect of contraceptive hormones is usually without clinical impact and leads to hypertension only in 2% - 5% of cases [2]-[4]. The objective of this study is to describe the epidemiological, clinical and therapeutic patterns of hypertension occurring in women on hormonal contraception at the Family Planning Unit of the Department of Obstetrics and Gynecology of the Yalgado Ouédraogo Teaching Hospital, to help improve safety in contraceptive use.

2. Materials and Methods

A retrospective study was carried out over a period of 5 years, from 1st January 2008 to 31st December 2012. It involved clients on hormonal contraception who developed hypertension during follow-up at the Family Planning Unit of the CHU-YO. Were included in the study the patients whose blood pressure was normal at the beginning of the hormonal contraception and who presented a hypertension in the course of use of these contraception. The review of data in the client's medical records was the technique used. In each medical record, there were data about: socio-demography, past medical history, gynecological and obstetrical history, information contraception used and data on hypertension developed.

Hypertension was defined as a systolic blood pressure superior or equal to 140 mmHg and/or diastolic blood pressure at least 90 mmHg and we have used the cut off values of the WHO, 1999 for the grading: mild hypertension or grade 1 for SBP [140 - 159 mmHg]/DBP [90 - 99 mmHg]; moderate hypertension or grade 2 for SBP [160 - 179 mmHg]/DBP [100 - 109 mmHg]; severe hypertension or grade 3 for SBP \geq 180 mmHg/DBP \geq 110 mmHg [5]. After the onset of hypertension, the cases were followed up for six months to assess the outcome. For quantitative variables, mean values were calculated. Student's test was used to compare these mean values. The proportions were determined for categorical variables and comparison was done using the Pearson Chi2 test (Fisher exact test for theoretical numbers less than 5) considering a risk of error of 5%. The missing data and the outliers were ignored in the analysis. We have kept anonymous and confidential patients' informations and the collected data. However we could not submit to the ethics committee for approval.

3. Results

3.1. Frequency of Hypertension

During the study period, 4439 clients had used hormonal contraceptives in whom 79 had developed hypertension during the follow-up period with an overall incidence of 1.8%. The average time of follow up from the be-

ginning of the contraception to the onset of the hypertension for the patients under COCs and those on injectable progestin were respectively 17 and 36 months [1 - 101 months]. The similar average time for the patients on implant contraceptive was 38 months.

The cases of hypertension were distributed as follow: combined oral contraceptives 51 cases (64.6% of cases of hypertension), injectable progestin 17 (21.5%) and contraceptive implants 11 (13.9%).

3.2. Demographics Characteristics of Patients

The mean age of patients who developed hypertension was 35.6 ± 8.4 years, ranging from 20 years to 53 years. Patients aged 35 and over accounted for 56.9% of cases (45). Women living in couple were 72 (91.1%) of cases. The secondary level of education was not completed by 42 patients (53.1%).

3.3. Clinical Characteristics of Patients at the Start of Hormonal Contraception

A history of pregnancy induced hypertension was found in 5 (6.3%) cases. The proportion of patients who previously used a hormonal contraceptive method was 40.5% (32). The mean number of pregnancies per woman was 3.5 [0 - 9] and the mean parity was 3.3 [0 - 9]. Family history of hypertension and diabetes were present in respectively 16 (20.3%) and 3 (3.8%) cases. The mean weight was 71.2 ± 12.4 kg. The average blood pressure was 110 mmHg [100 and 130 mmHg] for systolic and 70 mmHg [50 and 85 mmHg] for the diastolic.

3.4. Patient Characteristics at the Discovery of High Blood Pressure

The mean weight was 75.6 ± 13.5 kg (higher than the mean weight at the time of initiation of the contraception; $p = 0.041$ student-test). The mean blood pressure was 150 mmHg [140 - 180 mmHg] for the systolic and 100 mmHg [90 - 130 mmHg] for the diastolic. Sixty-seven patients (84.8%) had mild to moderate hypertension (Table 1).

Headache (20.2%) and palpitations (17.7%) were commonly reported complaints by the hypertensive patients (Table 2). The same patient could have many symptoms.

3.5. Results According to the Type of Hormonal Contraception

3.5.1. Combined Oral Contraceptives (COCs)

Out of a total 1209 COC users, hypertension was diagnosed in 51 cases (4.2%). The mean age of these patients was 34.4 ± 8.2 years [20 - 50]. Patients aged 35 and over accounted for 52.9% of cases. The mean systolic blood pressure (SBP) was 150 mmHg and the diastolic blood pressure (DBP) of 100 mmHg with a range of [140 - 180

Table 1. Distribution of patients according to the grade of hypertension.

Classes of Hypertension	Numbers	Relative Frequency (%)
Grade 1 or Mild Hypertension	21	26.6
Grade 2 or Moderate Hypertension	46	58.2
Grade 3 or Severe Hypertension	12	15.2
Total	79	100.0

Table 2. Frequency of subjective manifestations at the discovery of hypertension.

Complaints	Numbers	Relative Frequency (%)
Headaches	16	20.2
Palpitations	14	17.7
Dizziness	08	10.1
Asthenia	08	10.1
Others*	02	2.5

*Chest pain (1), Muscular pain (1).

mmHg] for SBP and [85 - 130 mmHg] for DBP at the discovery of hypertension. These means blood pressure were respectively 110 mmHg and 70 mmHg at the beginning of contraception. Hypertension was mild or moderate in 44 (86.3%) cases. **Table 3** summarizes the distribution of patients on COCs according to the hypertension's grade.

3.5.2. Progestin Oral Contraceptives

None of the clients who opted for progestin-only pills has developed hypertension.

3.5.3. Injectable Progestin

Two types of injectable were used: depo-medroxyprogesterone acetate in 1596 cases (91.1%) and norethisterone enanthate in 156 cases (8.9%). among users, 17 (0.97%) have had hypertension. The mean age of these patients was 38.5 ± 8.8 years, ranging from 23 years to 53 years. Patients aged 35 years and over were 12. The means SBP was 148.2 ± 8.8 mmHg and the DBP of 97.6 ± 7.5 mmHg at the discovery of hypertension. At the initiation of contraception, it was respectively 116.5 ± 9.3 mmHg and 69.7 ± 9.4 mmHg for the SBP and DBP.

3.5.4. Implants Contraceptive

Two types of implants were used all were levonorgestrel based: the implant with six capsules ($36 \text{ mg} \times 6$) and one to two capsules ($75 \text{ mg} \times 2$) respectively by 458 (42.5%) and 619 (57.5%) clients. Hypertension was found in 11 cases (1%). The mean age of patients with implants was 36.6 ± 8.4 years, ranging from 26 years to 49 years. Patients of 35 years and older were 6. The means SBP was 156.8 ± 15.2 mmHg and the DBP of 98.6 ± 7.1 mmHg with extremes ranging respectively from 140 - 180 mmHg and 90 - 110 mmHg for the SBP and the DBP. At the initiation of contraception, the means SBP was 115.0 ± 8.0 mmHg and a DBP of 73.2 ± 8.5 mmHg with extremes ranging respectively from 100 - 130 mmHg and 60 - 85 mmHg.

3.6. Therapeutic Decision

After the discovery of hypertension, there was a change in contraceptive methods in 60 (75.9%) cases, discontinuation of contraception in 4 (5.2%) and continuation of the same contraceptive method in 7 (8.9%) cases. Where there was a change in the contraceptive method, the new methods used were non hormonal in 38 (63.3%) cases against hormonal with microprogestatives in 22 (36.7%) cases.

3.7. Evolution of Blood Pressure According to the Therapeutic Decision

Blood pressure was normalized in 35 patients (44.3% of the sample). None of the patients who continued the same contraceptive method had obtained a normalization of blood pressure. **Table 4** summarizes the evolution of the blood pressure according to various factors.

The mean age of patients who achieved normalization of blood pressure was significantly lower than that of patients whose BP was not normalized (32.9 vs 37.6 years; Student test $p = 0.013$). The mean time BP normalization was 4.4 months.

4. Discussion

The overall frequency of hypertension associated with hormonal contraception (1.8%) was close to the values in the literature (between 2 and 5%) [2] [4]. The occurrence of hypertension varied by type of hormonal contraceptive, mostly observed with COC use (4.2% vs 0.97% and 1% respectively with injectables and progestin im-

Table 3. Distribution of patients on COCs according to the hypertension's grade.

Hypertension's Grade	Numbers	Relative Frequency (%)
Grade 1	15	29.4
Grade 2	29	56.9
Grade 3	7	13.7
Total	51	100.0

Table 4. Factors associated to the normalization of the blood pressure.

Associated Factors	Normalization of the BP	Total	P value
Continuation of method			
Change of method	31 (51.7%)	60	<0.01
Discontinuation of method	4 (33.4%)	12	
Type of new contraceptive method in case of change of method			
Non hormonal contraception	23 (60.5%)	38	<0.001
Microprogestative contraception	8 (36.4%)	22	
Past personal or family history of hypertension			
Absent	29 (54.7%)	53	≪ 0.001
Present	6 (31.6%)	19	

plants) as reported in the literature [6]-[8]. The effect of COC on the increase in blood pressure is mostly due to estrogen whose mechanism involves the activation of the renin angiotensin aldosterone system, probably on sodium and water retention by the interaction with the mineralocorticoid receptors [4] [9] and more recently, a decrease in endothelium-dependent vasodilation mediated by nitric oxide [10]. The mean time of discovery of hypertension was 17 months among clients under COC (36 and 38 months respectively for progestin and injectable implant group). The risk of developing hypertension is proportional to the contraceptive usage time and is three times greater if this time exceeds five years [4].

The mean age of patients was 35.6 years and patients aged 35 years and above were the majority. A personal history of pregnancy induced hypertension and a family history of hypertension were found in 6.3% and 20.3% of cases respectively. It is recognized in the literature that among hormonal contraceptive users, the presence of cardiovascular risk factors, hypertension and an old age above 35 years are factors leading the occurrence of hypertension [2]-[4] [8]. At the initiation of hormonal contraception, it is important that the various risk factors are taken into account in accordance with the medical eligibility criteria published by the World Health Organization and a benefit-risk ratio should be established [11]. Adequate monitoring must be provided to detect and manage the side effects on time.

Clinically, the hypertension was usually mild to moderate in 84.8% of cases. Indeed, oral contraceptives increase moderately the mean values of diastolic and systolic blood pressure [12] [13]. The mean elevation of blood pressure elevation are 6 to 7 mmHg for systolic and 1 to 2 mmHg for diastolic soon after usage of a products containing 50 to 100 micrograms of synthetic estrogens [4]. The blood pressure was normalized in 48.6% of cases within an average of 4 months, in patients who stopped or changed methods of hormonal contraception. The reversibility of the hypertension after stopping contraception is mentioned in the literature [2]-[4]. The normalization of the BP is affected by the new contraceptive option, patient's age and the presence of past history of hypertension.

5. Conclusion

Hypertension associated with hormonal contraception usage is not uncommon especially with the COC. It is generally mild or moderate and has a favorable prognosis with the adjustment of contraception method. It is important that the various risk factors for developing hypertension are taken into account before initiation of a hormonal contraceptive method. Adequate monitoring including monitoring of blood pressure is required for clients on hormonal contraception.

Acknowledgements

Diallo Abdoul Azize: for the translation into English.

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