

AFRICAN JOURNAL OF MEDICINE

and medical sciences

VOLUME 22, NUMBER 1, MARCH 1993



EDITOR: B.O. ONADEKO
ASSISTANT EDITORS:
B.O. OSOTIMEHIN and A.O. UWAIFO



SPECTRUM BOOKS LIMITED
Ibadan • Owerri • Kaduna • Lagos

ISSN 1116-4077

Morbidity and mortality from postpartum hypertension in Nigerian women

L.I. OJOGWU and U.G. OFILI*

*Departments of Medicine, * Obstetrics and Gynaecology, University of Benin Teaching Hospital, Benin City, Nigeria*

Summary

Two hundred and ten patients who were normotensive during pregnancy and labour but developed hypertension during puerperium have been studied. Two groups were identified with this unexpected postpartum hypertension. Although the patients in group A who had earlier onset hypertension were younger and mainly nulliparas, there was no significant difference between both groups with respect to age, serum creatinine, blood urea, blood pressures and presence of abnormal urine sediment at the onset of illness.

The incidence of postpartum hypertension was 3.5 per cent; there was remission of hypertension in 8 patients (3.8%) without treatment, recurrence in 17 (8%) while cardiac failure occurred in (5.4%), cerebrovascular accident in 3 (1.4%) and acute oliguric renal failure in 3 (1.4%). Overall mortality was 0.9 per cent while persistent or chronic hypertension was observed in 52 (23.8%) Postpartum hypertension is a definite clinical entity with significant morbidity and mortality. Frequent monitoring of blood pressure in the puerperium is advocated to avoid or reduce cardiovascular, cerebrovascular and renal complications of postpartum hypertension in susceptible women.

Résumé

On a étudié deux cent-dix patients qui étaient normotendus pendant la grossesse et l'accouchement mais qui ont développé de l'hypertension pendant le puerperium. On a identifié deux groupes qui avaient cette hypertension inattendue du post-partum. Bien que les patientes du groupe A qui avait de l'hypertension plus tôt au début soient plus jeunes et nullipares en majorité, il n'y

avait pas de différence significative entre les deux groupes en ce qui concerne l'âge, la créatinine de sérum, l'urée sanguine, les pressions du sang et la présence d'un sédiment anormal de l'urine au commencement de la maladie.

L'incidence de l'hypertension du post-partum a été de 3.5 pour cent; il y a eu une remission de l'hypertension chez 8 patientes (3.8%), de la récurrence chez 17 (8%) tandis que la défaillance cardiaque est arrivée chez (5.4%), un accident de vaisseau cérébral chez 3 (1.4%) et une défaillance oligurique aiguë de rein chez 3 (1.4%). La mortalité hors tout était de 0.9% alors que de l'hypertension persistante ou chronique a été observée chez 52 (23.8%). L'hypertension du post-partum est donc une entité clinique certaine ayant une morbidité et une mortalité significatives. On préconise un contrôle fréquent de la pression du sang pendant le puerperium afin d'éviter ou de réduire des complications cardio-vasculaires, cérébro-vasculaires et rénales de l'hypertension du post-partum chez les femmes qui y sont sensibles.

Introduction

In 1934, Stout [1] drew attention to a condition in which hypertension was observed six weeks postpartum in apparently normal patients; he reported on 102 such patients. All of these patients during that particular pregnancy and labour showed normal blood pressure readings. Since that report there have been other publications of similar cases [2-5]. Early reports of this syndrome suggested it was a purely negroid problem, most of the patients were nulliparas, the maximum pressure while usually observed six weeks postpartum might be as late as sixteen weeks postpartum and that the syndrome might or might not be present at subsequent pregnancies [2,4]. In addition to those patients who showed a rise in blood pressure six weeks postpartum following a normal pregnancy, Kaltreider and Gilbert [2] described another group of patients in whom the

Correspondence: Dr. L.I. Ojogwu, Department of Medicine, University of Benin Teaching Hospital, P.M.B. 1111, Benin City, Nigeria.

blood pressure elevations began 48 hours postpartum and before the six weeks postnatal examination. The illness which this group experienced was designated early unexpected puerperal hypertension.

We have carried out a prospective study at the University of Benin Teaching Hospital, Benin City, Nigeria, principally to identify these two groups of patients who show a rise in blood pressure in the early and late puerperium. These cases have been studied to find out whether there were any immediate or remote hypertensive effects of postpartum hypertension following normal pregnancies. This paper reports the incidence of this syndrome and the morbidity and mortality arising from it.

Materials and methods

Unexpected postpartum hypertension was defined as an elevation of the blood pressure above physiological limits ($>140/90$ mmHg) as found after 48 hours of delivery and at the routine six weeks postnatal examination. In all the patients studied the antenatal and immediate postpartum blood pressure (within first 48 hours of delivery) were normal. Routine clinical history and examination were the source of most of the information analysed herein. Twelve lead electrocardiogram and six foot postero-anterior chest radiographs were performed in all cases. Laboratory indices measured included electrolytes and urea, serum creatinine and haemoglobin; urinalysis for evidence of proteinuria, casts, pus cells and microscopic haematuria.

During the years 1979 and 1980, there were recorded about 3,000 deliveries at the University of Benin Teaching Hospital, in each of those years. Excluded were the few Caucasians and Asians who had their babies during this period in the same hospital. There were 210 patients during the period of study whose cases satisfied the definition given above. Blood pressure recordings were by the nursing staff, crosschecked by one of us (U.G.O.) while the patients were in hospital. After discharge and before the routine six weeks postnatal clinic examination in hospital, blood pressures were taken at home by three medical aids who were recruited for this project assisted by some resident doctors.

Six weeks postnatal examination was carried out in the Obstetrics clinic of the hospital while

follow up was done in the outpatients' medical clinic by one of us (L.I.O.). At three monthly intervals, patients' blood and urine specimens were analysed for biochemical changes and evidence of urinary abnormalities. Anti-hypertensive medication was instituted using thiazide diuretics or methyldopa and hydralazine either singly or in combination. Complications of hypertension particularly sought for were congestive cardiac failure, renal impairment and cerebrovascular accidents.

Simple descriptive statistics were used. Mean values \pm standard deviations of the mean are given. The statistical significance of the difference between the two groups (A and B) was ascertained using chi-squared analysis.

Results

The mean age of the patients with postpartum hypertension was 24.6 ± 3.7 years (range 18–38 years). When considered according to the different groups, those in group A had a mean age of 23 ± 2.1 years while those in group B were 25 ± 1.9 years. There was no statistically significant difference between the groups as far as age was concerned. Table 1 shows the characteristics of all the patients at the onset of postpartum hypertension.

Although the patients in group A appeared younger and were mainly nulliparas, overall there was no statistically significant difference between both groups with respect to age, serum creatinine, blood pressure, haemoglobin, blood urea and abnormal urine sediment at onset of illness. Of the 210 patients who satisfied the criteria for this study, 140 had postpartum hypertension starting after 48 hours of delivery but before the routine six weeks postnatal visit (Group A), while 70 had their first recorded blood pressure elevation at the postnatal examination (Group B). Seventy per cent of Group A patients began their hypertensive rise between the second and seventh days postpartum. In those who developed hypertension later, the number of primary elevations gradually diminished, so that only 43 patients (30 per cent of group A) had the initial rise between one and six weeks postpartum.

In 17 out of the 140 patients in group A (12%), the highest blood pressure rise at any time during the period before the 6 weeks postnatal visit was 186 ± 10.2 mmHg (range 180–200 mmHg)

Table 1: Characteristics of the patients at the onset of postpartum hypertension

	Group A (n = 140)	Group B (n = 70)	P-value
Mean age in years	23 ± 2.1	25 ± 1.9	ns
Mean Parity	1 ± 0.2	3 ± 0.2	ns
Mean serum creatinine (mg/100 ml)	0.6 ± 0.04	0.7 ± 0.03	ns
Mean blood urea (mg/100 ml)	14 ± 2.1	15 ± 3.2	ns
Mean haemoglobin (g/100 ml)	11.4 ± 2.1	11.8 ± 2.6	ns
Mean blood pressure (mmHg)	175 ± 8 systolic 115 ± 5 diastolic	170 ± 5 systolic 110 ± 6 diastolic	ns ns
Abnormal urine sediment (proteinuria, casts, haematuria)	36	21	ns

ns = not significant

systolic and 118 ± 7.1 mmHG (range 115–130 mmHg) diastolic pressure. Significantly these readings were recorded in these patients within three to seven days of delivery. The remaining 123 patients in this group (88%) had a mean blood pressure of 144 ± 4.8 mmHg systolic (range 140–165) and 96 ± 3.4 mmHg diastolic (range 90–105). Overall 52 patients (groups A and B) had chronic or persistent hypertension at the end of one year follow up. Forty-six of these have

been followed up for a period ranging between 2 and 10 years. Of these 30 have had mild hypertension (140/90–150/100 mmHg) while 16 others have had more severe hypertension; all these patients have required anti-hypertensive medication. There was remission of hypertension or return to pre-pregnancy values in 34 patients at the end of one year follow up while contact was lost with 124 patients.

Table 2

	Group A	Group B
Congestive Heart Failure	11	—
Acute Oliguric Renal Failure	3	—
Cerebrovascular Accident	3	—
Persistent Urinary Abnormalities (Proteinuria, Casts)	6	3
Retinopathy	—	—
Cardiomegaly on Chest x-ray	11	4
Electrocardiographic evidence of hypertension (Left ventricular hypertrophy) with or without strain; or left bundle branch block	11	2
Subsequent Postpartum Hypertension	12	5

Table 2 shows the list of hypertensive complications observed in the women. Hypertensive retinopathy was conspicuously absent in all of them, including those with blood pressure as high as 200/130 mmHg. Congestive heart failure was diagnosed in 11 patients. Cardiomegaly, pulmonary oedema and electro-cardiographic changes of hypertension were present in some of these patients found to be in cardiac failure. In 7 women, cardiac failure occurred between one and two weeks postpartum while in 4 it occurred later in the puerperium. Significantly these 11 patients belonged to group A.

Three patients (1.4%) suffered from cerebrovascular accident between three and five days postpartum; one recovered with a mild hemiparesis, one had a subarachnoid haemorrhage confirmed by lumbar puncture; the third patient in addition to a cerebrovascular accident also went into acute oliguric renal failure and died from severe uraemia. Acute oliguric renal failure was noted in three patients, one recovered renal function after treatment which include intermittent peritoneal dialysis while two died from uraemia and septicaemia.

Thirty-five of the 210 patients were followed through subsequent pregnancies. Eight of these had hypertension in pregnancy requiring anti-hypertensive medication and this continued postpartum. However 17 of them again developed post partum hypertension while there was no recurrence of the syndrome in the remaining patients.

Discussion

Postpartum hypertension first described by Stout in 1934 [1] is now a well recognised entity. It occurs both in early and late puerperium. An incidence of 17.2 per cent was recorded by Stout [1] while Mayer [3] found an incidence of 4.6%. In our study the incidence was found to be 3.5%. 66.7% (140/210) of the patients developed hypertension before the routine six weeks postnatal examination. This indicates that postpartum hypertension occurs more commonly in the early puerperium. In earlier studies [1,3,4] of this syndrome there was no record of unexpected hypertension occurring a few days after delivery. 38.5% (45/140) of group A patients with early postpartum hypertension started showing a rise in blood pressure between the

second and seventh days. In those who had hypertension later, the number gradually decreased until the fifth and sixth weeks when there was a small number showing rise in blood pressure.

Early puerperal rise in blood pressure can only be detected if blood pressure recordings are taken soon after delivery and all the more frequently. It is suggested that since as much as 38.5% of these patients became hypertensive between the third and fifth days postpartum, patients who have had apparently normal antenatal and labour periods should not be allowed home until the fifth day when a satisfactory blood pressure level should determine the decision to discharge such patients from hospital. Women with normal, uncomplicated delivery are discharged home on demand most of the time in this hospital; when there is an acute shortage of beds, some patients are sent home as early as 48 hours after delivery. There is therefore the risk of missing out those who will develop the early rise in blood pressure. It is not logistically possible to visit the homes of all patients especially when they do not live within reach for auxiliary nurses or health visitors to measure their blood pressures. Domiciliary service is not available in Benin City; moreover most of the patients cannot afford to visit hospital daily for this exercise because of prohibitive transportation cost.

Stout reported that 91% of this patients had only transient hypertension, becoming normal by the end of one year while 9% still had hypertension at the end of a year. On the other hand Meyer and Nadler [4] reported that the phenomenon was a self-limiting one, and lasted for a period of six weeks to sixteen weeks. The results of our study showed that 52 out of 210 (25%) of the patients had a chronic or persistent hypertension at the end of one year follow up. Forty six of these have been followed up for periods ranging between two and ten years during which 30 have had mild hypertension (140/90–150/100 mmHg) while 16 have had more severe hypertension. Postpartum hypertension thus leads to chronic hypertension in some patients. It is not a completely transient phenomenon as earlier reported.

Postpartum hypertension may be present at subsequent pregnancies [4]. Thirty five of the patients in this study were followed through at

least one subsequent pregnancy each and in 17 of them there was recurrence of early postpartum hypertension. Hypertensive complications recorded in this study are shown in Table 2. This again emphasises the point that postpartum hypertension should be detected early enough to institute adequate medical therapy. Meyer and Nadler [4] failed to observe congestive heart failure in any of their cases. Eleven of our patients were found to be in congestive cardiac failure. Postpartum heart failure occurring in Nigerian women has been reported [6]. Several aetiological factors have been considered but it was argued that the clinical syndrome was more compatible with a hypertensive origin than with intrinsic myocardial disease [6-10, 11-13, 14-16]. In 20 of the 50 cases described by Brockington [6] the onset of symptoms was within six weeks of puerperium. These patients correspond to group A of our study patients in which category all the 11 patients in congestive cardiac failure belonged. Postpartum heart failure could be a form of acute hypertensive heart failure; detection and treatment of hypertension in the puerperium is therefore suggested as a logical approach to the prevention of such cardiac failure.

Acute oliguric renal failure and cerebrovascular accident occurred in three patients postpartum. Musser *et al* [17] described acute nephritis with onset about three weeks after delivery. Acute renal failure is therefore not uncommon in the puerperium. The syndrome of postpartum renal failure was recognised since 1968 as an idiopathic condition characterised by clinically overt symptoms occurring at least three or more days after an uncomplicated delivery [18]. The role of hypertension in the syndrome is not clear. Persistent urinary abnormalities such as proteinuria, casts and microscopic haematuria have been observed in 6 of group A patients and in 3 of group B patients. These patients may have underlying glomerular changes but no renal biopsies were done to confirm these changes.

Postpartum hypertension has been observed by other workers in Nigeria [19,20]. In one series, 38 patients were identified with this syndrome by Okuwobi [19]; some of them showed a remission of their hypertension after a follow up period ranging from one to four years. Other patients initially required large doses of antihypertensive therapy but later become normotensive without

requiring any specific drugs. Significantly many of the patients had severe hypertensive retinopathy unlike our study patients who showed very little retinal changes. Cerebrovascular accidents and cardiac failure occurred in some of the patients, a finding similar to ours.

Our results have shown that postpartum hypertension is a definite clinical entity with significant morbidity and mortality to susceptible women during the puerperium.

Frequent monitoring of blood pressure in the puerperium is advocated to detect hypertension and institute appropriate treatment. By so doing, cardiovascular, cerebrovascular and renal complications can be reduced or prevented.

Acknowledgements

We are grateful to the Consultants in the Department of Obstetrics and Gynaecology, University of Benin Teaching Hospital for allowing us use their patients for this study. We are also grateful to all the resident doctors who assisted us, especially Doctors K. Atuah and P. Okome. Partial support was given by the University of Benin Teaching Hospital by providing transport for home visits.

References

1. Stout ML. Hypertension 6 weeks postpartum in apparently normal patients. *Am. J. Obstet. Gynaec.* 1934; 27: 730-733.
2. Kaltreider D, Gilbert CR. Unexpected hypertension in the early and late puerperium. *Am J. Obstet Gynaec* 1951; 61, 1: 161-166.
3. Meyer H. Postpartum hypertension following a normal pregnancy. *Am. J. Obstet. Gynaec.* 1938; 25: 150-155.
4. Meyer H, Nadler SB. Unexpected postpartum hypertension. *Am. J. Obstet. Gynaec.* 1941; 231-236.
5. Piver MS, Corson SL, Bolognese RJ. Hypertension 6 weeks postpartum in apparently normal women. *Obstet Gynaec.* 1967; 30: 238-241.
6. Brockington IF. Postpartum hypertensive heart failure. *Am. J. Cardiol.* 1971; 27: 650-658.
7. Benchimol AB, Garneiro RD, Schlesinger P. Postpartum heart disease. *Brit. Heart J.* 1959; 89-100.
8. Blegen SD. Postpartum congestive heart failure. *Acta. Med. Scand.* 1965; 178: 515-524.

9. Davidson N McD, Parry EHO. Peripartum cardiac failure. *Quart. J. Med. NS* 1978; 188: 431-461.
10. Freeman AM. Acute postpartal heart failure. *J. Med. Ass. Alabama* 1946; 17: 163-167.
11. Meadows WR. Idiopathic myocardial failure in the late trimester of pregnancy and the puerperium. *Circulation* 1957; 903-914.
12. Meadows WR. Postpartum heart disease. *Amer. J. Cardiol* 1960; 6: 788-802.
13. Melvin JP. Postpartal heart disease. *Ann. Intern Med.* 1949; 27: 596-609.
14. Musser JJ, Sodemmaan WA, Turner RJ. Heart failure or acute nephritis with onset about 3 weeks after delivery. *Ann. Intern. Med.* 1938; 12: 739-753.
15. Seftel H, Susser M. Maternity and Myocardial failure in African women. *Brit. Heart J.* 1961; 23: 43-52.
16. Stuart KL. Cardiomyopathy of pregnancy and the puerperium. *Quart. J. Med. NS* 1968; 37: 730-733.
17. Walsh JJ, Burch GE. Postpartal heart disease. *Arch. Intern. Med. Chicago* 1961; 108: 817-822.
18. Hayslett JP. Post partum renal failure. *N. Engl. J. Med.* 1985; 312: 1556-1559.
19. Okuwobi BO. Postpartum hypertension. In: Akinkugbe OO, Bertrand ED, (eds). *Hypertension in Africa. Lagos: Literamed Publication, 1975; 156-160.*
20. Davidson N McD. Postpartum hypertension in Zaria, Northern Nigeria. In: Akinkugbe OO, Bertrand ED, (eds). *Hypertension in Africa. Lagos: Literamed Publications, 1975: 161-170.*

(Accepted 18 October, 1990)

DIGITIZED BY E-LATUNDE ODEKU LIBRARY COLLEGE OF MEDICINE