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RESEARCH LETTER

Hypertension management in Kumasi: barriers and prejudice?

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Hypertension and its complications of heart attack, stroke and renal failure are the cause of significant mortality and morbidity within Ghana.[1] Few studies exist that examine compliance with antihypertensive medication among the Ghanaian population[2] and none has examined the characteristics of those patients found to be noncompliant. A recent small prospective cohort study, part of a medical student elective, at the Komfo Anokye Teaching Hospital, Kumasi, assessed the degree of noncompliance among patients attending the Renal Hypertension Clinic and ascertained the reasons for this. Full ethical approval was obtained from St George's and Kumasi institutional ethics committees.

We aimed to recruit all consecutive patients attending the Renal Hypertension Clinic between 5 October and 9 November 2004. Patients had all degrees of hypertension and were either referred to the clinic through their local doctor or the Hospital or were self-referrals. As far as could be ascertained from the limited baseline investigations allowed, there were no secondary causes of hypertension and none had severe renal failure. Of the 102 patients screened, 100 were eligible and 86 were subsequently followed up. The main reason for loss to follow-up was distance from the hospital and unavailability on three consecutive attempts. Screening and follow-up interviews were conducted 1 month apart. A detailed questionnaire was completed on both occasions which covered, inter alia, demography; education, participants being grouped according to their level of formal education, that is, tertiary, secondary, primary, or none; their use of herbal medicines; whether they sought treatment elsewhere; and, at the follow-up, their compliance with treatment and reasons for missing medication during the study period. Height was measured without shoes, using a wooden platform and a height rule, to the nearest 0.5 cm. Weight was measured to the nearest 0.5 kg with manual Seca 761 scales (Vogel & Halke, Germany) after the participants had removed their outer garments and footwear. Body mass index (BMI) was calculated as weight (kg) divided by height (m^2). Blood pressure (BP) and pulse rate were measured after the participant had been sitting upright for at least 5 min with an automatic machine (OMRON HEM705CP sphygmomanometer, Omron Matsusaka Co., Ltd, Japan.[3] The appropriate cuff size (13×23 or 16×30 cm) was used and the same size was used at follow-up. Three readings were taken 1 min apart. The first was discarded and the mean of the last two readings was used in the analysis. Hypertension was defined as a systolic BP $\geqslant$ 140 mmHg and/or a diastolic BP $\geqslant$ 90 mmHg or being on drug therapy for hypertension. All participants fulfilled this criterion at baseline. Results are expressed as either *n* (proportions %) or as mean (s.d.). Comparisons between groups were carried out by χ^2 statistics and differences expressed as odds ratios (OR) and 95% confidence intervals (CI). A *P*-value less than 0.05 was considered statistically significant.

In the group that was followed-up 37% (32/86) were found to have been noncompliant with medication during the study (Table 1). The two groups were followed up for a comparable period of time (26 days (range 21–50) the compliant group and 25 days (21–49) the noncompliant group). Forgetting to take the medication was the commonest explanation for noncompliance (11 or 34%), followed by the prohibitive cost of the pills (10 or 31%). The noncompliant patients tended to have a lower BMI (25 ± 5 *vs* 29 ± 7 kg/m^2), but tended to have higher BP ($152/90 \pm 29/15$ *vs* $147/87 \pm 22/10$ mmHg at baseline and $142/83 \pm 23/10$ *vs* $137/81 \pm 16/8$ mmHg at follow-up). A significantly greater proportion had attended school (OR = 2.60 [95% CI 0.91–7.80]; $\chi^2 = 3.85$, $P = 0.049$) and as a group their educational level was higher ($P = 0.038$) than that of the compliant group. In addition, significantly more patients from the non-compliant group had sought treatment elsewhere prior to attending the hospital clinic (OR = 4.80 [1.41–17.0], $\chi^2 = 8.45$, $P < 0.004$). The non-compliant group tended to use more herbal medicines than the compliant group (OR = 2.05 [0.69–6.15], $\chi^2 = 2.07$, $P = 0.15$), although these findings were not statistically significant.

This study assessed the level of compliance with antihypertensive medication among patients attending the Renal Hypertension Clinic at Komfo Anokye Teaching Hospital in Kumasi and attempted to establish the barriers and possible prejudices to it. Our results indicate forgetfulness and cost as

Table 1 Characteristics of compliant and noncompliant group

Variable	*Compliant* (n = *54*)	*Noncompliant* (n = *32*)
Age (years)	59.1 (28)	58.4 (19)
BMI (kg/m^2)	28.7 (7)	25.4 (5)
Systolic BP (mmHg)	147 (22)	152 (29)
Diastolic BP (mmHg)	87 (10)	90 (15)
Pulse rate (b.p.m.)	85 (19)	83 (13)
Attended school* *n* (%)	29 (54)	24 (75)
Level of education* *n* (%)		
None	25 (47)	8 (25)
Primary	11 (20)	13 (41)
Secondary	11 (20)	10 (31)
Tertiary	7 (13)	1 (3)
Sought alternative medicine** *n* (%)	6 (11)	12 (37)
Use of herbal medicine *n* (%)	11 (20)	11 (34)
Reported non-compliant in the past *n* (%)	35 (65)	22 (69)
Follow-up (days) *n* (range)	26 (21–50)	25 (21–49)
Reported pills taken (%) (range)	65 (21–174)	68 (21–140)

*$P \leqslant 0.05$, **$P < 0.004$.

the major reported barriers to compliance with antihypertensive therapy. Furthermore, likely predictors of noncompliance appeared to be a greater level of educational attainment (in respect both of whether school had ever been attended and of the actual level of education achieved) and the tendency to have sought alternative treatment through traditional medicine. Our study supports previous results from a pilot study in Kumasi that found a rate of noncompliance of 93%.[2] Important differences between studies, however, are the different cutoff point of compliance used, and the fact that the present study assessed compliance prospectively by seeing the participants, whereas the previous study relied on retrospective recall of pill usage, with likely introduction of bias. A recent study in Egypt is also in agreement with our findings.[4]

There were several limitations to our study. Although each screened participant agreed to take part, only 86% were subsequently followed up. The results would have been more robust if all patients had been followed up. The participants lived predominantly within Kumasi itself, making it difficult to extrapolate the findings to cover other regions and settings in Ghana. It would be interesting to repeat similar studies in rural areas, where detection rates and level of management of hypertension are lower than in Kumasi.[3] The results depended on each individual honestly admitting to missing their medication. Fewer patients were found to have been noncompliant during the study than admitted missing pills prior to it. This could have been due to a genuine increase in the number of pills taken. The noncompliant group seemed to be more severe than the compliant group, but experienced the same reduction in BP after follow-up. Clearly further studies need to be carried out more directly to relate noncompliance to antihypertensive efficacy.

Greater reliance on alternative sources of treatment among the noncompliant group, and the negative association between level of education and compliance, suggests a more sceptical approach among these patients to the conventional healthcare provided by the hospital. In the UK there is greater usage of alternative medicines, particularly vitamin supplements, among better-educated, wealthier first generation women of African descent.[5] Similar attitudes towards alternative medicine have been described in the US[6] and Australia.[7] Although part of a developing country, Kumasi is comparatively westernised and some of the better-educated patients may have been exposed to alternative theories concerning the medical treatment of hypertension. If so, any future initiatives aimed at tackling the low levels of compliance must take this into account. Reliance on herbal remedies for the treatment of hypertension is probably a prognostic indicator of compliance with antihypertensive drugs. In Nigeria 21% of respondents to a study evaluating misconceptions of hypertension among hypertensive patients felt they would achieve permanent cure only from alternative medical practitioners.[8] The same study advocated greater emphasis on medical education for all patients, irrespective of their level of education, as a means of dispelling misconceptions regarding the disease.

What is known on this topic
- Hypertension is common in West Africa.
- Resources are scarce and detection, management and control are haphazard.
- A few secondary care facilities are now available.
- However, little is known about compliance to 'prescribed' drug therapy in these settings.

What this study adds
- At least in Ghana, where drug therapy is not free at the point of need, cost is a barrier to compliance.
- Forgetfulness seems also to be an important barrier, perhaps reflecting lack of awareness of its importance, even among those better educated.
- Noncompliant patients were more likely to be better educated and tended to rely more on alternative medicine.

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References

1 Plange-Rhule J *et al.* Hypertension and renal failure in Kumasi, Ghana. *J Hum Hypertens* 1999; **13**: 37–40.

2 Buabeng KO, Matowe L, Plange-Rhule J. Unaffordable drug prices: the major cause of non-compliance with hypertension medication in Ghana. *J Pharm Pharmaceut Sci* 2004; **7**(3): 350–352.

3 Cappuccio FP *et al.* Prevalence, detection, management and control of hypertension in Ashanti, West Africa. *Hypertension* 2004; **43**: 1017–1022.

4 Youssef RM, Moubarak II. Patterns and determinants of treatment compliance among hypertensive patients. *East Mediterr Health J* 2002; **8**(4–5): 579–592.

5 Cappuccio FP, Duneclift SM, Atkinson RW, Cook DG. Use of alternative medicines in a multi-ethnic population. *Ethn Dis* 2001; **11**: 11–18.

6 Eisenberg DM *et al.* Trends in alternative medicine use in the United States, 1990–1997. Results of a follow-up national survey. *JAMA* 1998; **280**: 1569–1575.

7 MacLennan AH *et al.* Prevalence and cost of alternative medicine in Australia. *Lancet* 1996; **347**: 569–573.

8 Oke DA, Bandele EO. Misconceptions of hypertension. *J Natl Med Assoc* 2004; **96**(9): 1221–1224.