

Guidelines and management of mild hypertensive conditions in pregnancy in rural general practices in Scotland: issues of appropriateness and access

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Objectives: To assess the diagnosis and management of mild non-proteinuric hypertension in pregnancy in rural general practices against guideline recommendations.

Design: Postal survey and telephone interview.

Setting: All 174 designated rural general practices in Scotland.

Sample: 171 GPs and 158 midwives responsible for antenatal care stratified by distance from a specialist maternity hospital.

Main outcome measures: Accuracy of diagnosis and appropriateness of management compared with guideline.

Results: At least one respondent replied for 91% (158/174) of rural practices. Response rates were 68% (117/170) for GPs and 77% (121/158) for midwives. Both GP and midwife replied for 46% (80/174) of practices. Most GPs (80%, 87/109) and midwives (63%, 71/113) overdiagnosed the scenario. Intended management was therefore most often referral or admission to specialist hospital (59%, 132/224), both courses of action beyond guideline recommendations. There was an association between distance of practice from specialist maternity hospital and professionals' report of intended referral or admission. Explanatory factors from telephone interviews included a poor knowledge base, cautious risk assessment, and perceived inflexibility of guidelines for remote situations.

Conclusions: There is a lack of accuracy in the diagnosis of a common antenatal problem and intended management is consistent with overdiagnosis. The results suggest that women in rural settings may experience more antenatal referrals and admissions than are clinically appropriate according to the guidelines. At a time of increasing centralisation of maternity services, this could increase inappropriate referrals and increase costs to service and patients. Quality of care may be improved by developing consensual local guidelines with rural maternity care professionals and support maintained skills and confidence in decision making.

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In the last 10 years the developing evidence base and policy recommendations have urged the devolution of routine antenatal care from hospital to community settings and primary healthcare professionals.^{1–5} However, these recommendations have made little distinction between urban/rural communities or types of general practice, and much of the evidence to inform care guidelines is from studies in tertiary care and urban settings.^{6–8}

There are few studies about antenatal care provision and referrals from rural settings in the UK, although a recent report indicated that one third of the population of Scotland live in rural areas.⁹ There is continuing debate internationally over how best to define rurality and remoteness for healthcare research.^{9–11} Definitions of rurality have variously taken into account peripherality, population density, settlement patterns, demographic and economic profiles. Distance from key services is held to be an important variable affecting healthcare organisation and delivery in different locations.¹² Such a pragmatic approach to rural designation of units in relation to a healthcare sector or speciality has been recommended by Rousseau.¹³

UK studies in different specialties have shown that hospital use and referrals may be lower with increasing distance from specialist services, an effect known as "distance decay".^{12, 14} In studies of antenatal service the findings are less clear. For example, whereas one Irish study noted that distance from the antenatal clinic resulted in delayed first appointment by 3 weeks,¹⁵ other reports have shown a higher rate of transfer to hospital antenatal care for women in rural New Zealand¹⁶ and

increasing remoteness was associated with increased rates of antenatal transfer.¹⁷ One explanation suggested by Carr-Hill and colleagues is that doctors and their rural patients make similar and more cautious risk assessments about the need for specialist maternity care and are more likely to refer to pre-empt any potential crisis.¹⁴ At a time when rationalisation and further centralisation of acute services is underway, centralisation of specialist maternity services is also being considered and information on the impact on care and referrals is important.¹⁸ In the "Framework for Maternity Services in Scotland" published by the Scottish Executive Health Department in 2001 it is suggested that locally agreed guidelines will need to be in place in remote and rural settings.¹⁹ Within this context we have explored the adherence to a national guideline for the diagnosis and management of mild hypertension arising in pregnancy by GPs and midwives in rural practice.²⁰

Mild and non-proteinuric hypertension is a common problem that develops in about 10% of all pregnant women, with clinical uncertainty about whether initial mild symptoms will remain mild, slowly evolve, or become a fulminating process.²¹ The overall current incidence of eclampsia in the UK is 0.49 per 1000 pregnancies.²² Severe hypertensive disorders including pre-eclampsia are associated with poor maternal and infant outcomes.²³ However, a national guideline gave clearly defined levels of severity of disease and recommended elements of care in basic surveillance for management of mild non-proteinuric hypertension.²⁰

This study explored the quality of antenatal care by assessing the diagnosis and management of scenarios of mild non-proteinuric hypertension by rural practitioners against guideline recommendations. The dimensions of quality of care considered were accuracy in diagnosis and the appropriateness of intended management in relation to the guideline. We further aimed to examine the relation between intended management and distance of the practice from the specialist maternity hospital. Qualitative methods were used to gain insight into questionnaire replies. The implications of the findings are discussed, both for women receiving antenatal care in rural settings and for maternity services at a time of further centralisation in Scotland.

METHODS

Sample and setting

The study took place between October 2000 and January 2001. The sample consisted of all listed 174 general practices designated as rural in Scotland by the NHS in Scotland Information and Statistics Division (ISD).²⁴ These are practices where a third or more of practice patients live over three miles from their central GP surgery and hence attract rural practice payments.²⁵ The study therefore included general practices located at a range of distances from specialist maternity care services including remote practices (island and other peripheral settings). The sample represents 16.5% of all general practices in Scotland. Each general practice was contacted by telephone to check practice location, that it provided antenatal care, and to identify the GP and midwife/practice nurse most involved in the provision of antenatal care.

Data collection and analysis

Postal questionnaire

Following a pilot study and revision, self-complete questionnaires and one reminder were mailed. The questionnaire contained two scenarios for mild non-proteinuric hypertension taken from the Scottish Obstetric Guidelines and Audit Project on mild non-proteinuric hypertension in pregnancy.²⁰ This national guideline uses the methodology of the Scottish Intercollegiate Guidelines Network (SIGN) and was developed by a multidisciplinary group from university teaching and district general hospitals, as well as by staff from primary/community care settings. It is based on grade C evidence for classification of hypertensive disorders in pregnancy, and grades B and A evidence for the method of diagnosis for proteinuria and the effective place of management for mild non-proteinuric hypertension, respectively. SIGN guidelines are widely circulated and are sent automatically to all GPs in Scotland.

Professionals were asked for their diagnosis and management for scenario 1 and management for scenario 2. Replies were compared with the correct diagnosis and the recommended management according to the guideline.²⁰

Numerical data were processed and checked using double data entry, and open item replies were transcribed verbatim and categorised. SPSS for Windows (Version 9.1) was used in descriptive analysis of frequencies and the χ^2 test for association of categorical data for distance from specialist services and intended management plan for scenario 1.

Telephone interviews

Respondents were also asked to indicate on the questionnaire if they were willing to take part in a telephone interview about the questionnaire. The practices were stratified by distance from the specialist maternity service into five groups (<10, 10–25, 26–50, 51–100, and >100 miles).

Ten practices were randomly selected (two from each distance level) from the subsample of practices where both GP and midwife had agreed to the interview, giving a total of 20

Box 1 The interview schedule

The interviewer (PS) reminded respondents about the questionnaire content and outlined scenario 1.

Verbatim reminders of:

- their written diagnosis and check to establish if respondents still agreed with that diagnosis;
- their written proposed management plan and an invitation to explain this choice.

Questions on:

- whether they would have suggested the same management plan if their practice was located within a city—for example, in the centre of Aberdeen;
- characteristics of their practice or circumstances that affected their management plan;
- possible differences in management if they had diagnosed mild non-proteinuric hypertension of pregnancy.

staff interviews. This method ensured that both GPs and midwives were interviewed across the range of distance categories. The same prompt guide was used for all respondents and no attempt was made to obtain saturation within emerging themes. Semi-structured telephone interviews conducted by one of the authors (PS) lasted up to 20 minutes, were audio-taped with consent, and fully transcribed. The interview schedule shown in box 1 was developed to validate and seek explanation of questionnaire replies. In particular, it explored issues of distance differentiation and rural context or other practice characteristics in relation to questionnaire replies. It tested the extent to which respondents might alter their written recommended management given the reassuring and correct diagnosis of mild non-proteinuric hypertension.

The interview schedule provided the framework for manual qualitative analysis. Themes within each question were identified. Data were independently analysed by two researchers (PS and JF) and consensus was reached about the description and interpretation of themes.^{26–27} Quotations are used to illustrate and offer explanation for points arising from quantitative results.

RESULTS

Response rates

One practice had split and two had merged, maintaining a total of 174 practices in which 171 GPs and 158 midwives were eligible and were included in the study. There were fewer GPs and midwives than practices because, in a small number of practices, only one professional provided antenatal care. One general practice refused to be mailed a questionnaire. The distance category of the practice from a specialist maternity hospital was taken as the GP response where available, and thereafter as the midwife response.

At least one professional returned a completed questionnaire for 158 (91%) of the 174 practices. The response rates were 68% (117/171) for GPs and 77% (121/158) for midwives. Both the GP and the midwife responded for 80 (46%) of the 174 practices. Respondents were stratified into five distance categories of the practice from the nearest specialist maternity unit (table 1). The practices were designated as distant if they were located ≥ 51 miles from a specialist maternity service. 60% of GPs and 65% of midwives who responded to the questionnaire agreed to a telephone interview, but *both* the GP and midwife agreed from only 30 practices. Of those practices where both the GP and midwife agreed to a telephone interview, two practices were randomly selected from each of the five distance categories resulting in 20 interviews.

Assessing reported diagnosis against guideline recommendation

The two scenarios both indicated mild non-proteinuric hypertension. Scenario 1 described slightly raised diastolic blood

Table 1 Distance from practice to the nearest specialist maternity hospital

Distance to maternity hospital (miles)	GPs' responses (n=117 practices)		Midwives' responses (n=121 practices)	
	Frequency	(%)	Frequency	(%)
<10	5	4.3	8	6.6
10–25	38	32.5	39	32.2
26–50	28	23.9	37	30.6
51–100	28	23.9	15	12.4
>100	18	15.4	21	17.4
Missing	0	0	1	0.8
TOTAL	117	100	121	100

pressure and estimation of protein in the urine by dipstick of only “+” proteinuria (plus reassuring information that the relatively dilute and acidic urine indicated a low probability of a false negative test). The guideline adheres to the traditional “++” dipstick estimate of urinary protein as the cut off for diagnosing proteinuria. Of 109 GPs and 113 midwives who provided a diagnosis, only one GP and one midwife diagnosed the woman (scenario 1, box 2) completely in accordance with the guideline as having “mild non-proteinuric hypertension”. If two less well defined answers (“hypertension” or “pregnancy induced hypertension”) are also accepted, then 11% (12/109) of GPs and 24% (27/113) of midwives gave an acceptable diagnosis (table 2).

At interview, all respondents agreed with their written diagnosis and management of scenario 1. However, there also appeared to be uncertainty and a poor knowledge base from some telephone interviews. For example, GPs stated:

“I think the knowledge base is poor—I mean I had to look up the guidelines to see what I should be doing, which is far from ideal!” (GP no 10911, ≥51 miles (51–100 miles)).

“It was the proteinuria I think that made me more concerned. With a diastolic of 93 mm Hg I think I would be happy to sit on her for a week or so, maybe check her a couple of times over the next you know, not just that one clinic visit, but I think the proteinuria throws her into a more concerning category” (GP no 13911, ≤50 miles (26–50 miles)).

Assessing intended management against guideline recommendation

According to the guideline, management should have been a basic surveillance programme consisting of blood pressure recording and urine dipstick twice weekly, clinical appraisal of

Box 2 Scenarios and recommended management from the Scottish Obstetric Guidelines and Audit project on the management of mild non-proteinuric hypertension in pregnancy²⁰

Scenario 1

Mrs EF, a 23 year old primigravida, attends your practice for a routine antenatal visit at 34 weeks' gestation. A diastolic blood pressure of 93 mm Hg is recorded in the clinic and confirmed over a 4 hour period. Dipstick testing reveals “+” proteinuria (with SG 1.04 and pH 8.3). The guideline states: Mrs EF has mild non-proteinuric hypertension. The requirement for diagnosis of proteinuria (++) is not met, so she should be managed by the basic surveillance programme. This includes blood tests for single estimate serum urate, urea and electrolytes, full blood count and platelets, and repeat twice weekly visits for blood pressure measurement and urinalysis until signs resolve or progress.

Scenario 2

Mrs GH, a 25 year old primigravida, attends her community midwife at 36 weeks' gestation for routine antenatal care. Her blood pressure is found to be elevated at 140/95. Urinalysis is negative, the fundal height measures 37 cm, and fetal movements are frequent. The midwife arranges assessment in the form of a home visit later that day (after an interval of >4 hours). At this visit her blood pressure again measures 140/95.

The guideline states: Mrs GH is a candidate for basic surveillance. The midwife should arrange for her to attend the surgery again the next day for blood to be taken, for single estimate serum urate, urea and electrolytes, full blood count and platelets, and repeat blood pressure recording and urinalysis. Thereafter, arrangements should be made for twice weekly home visits until signs resolve or progress.

maternal and fetal well being and fetal size, and single blood tests (box 2). Of 108 GPs and 117 midwives who provided a management plan, three GPs (3%) and six midwives (5%) correctly described all the parts of the basic surveillance according to the guideline. Considering the elements of the basic surveillance, seven GPs (7%) and 10 midwives (9%) said they would check blood pressure twice weekly, and similar proportions said they would check urine twice weekly. A further seven GPs (7%) and 13 midwives (11%) would check blood pressure and urine more than twice weekly, and 11 GPs (10%) and 19 midwives (16%) stated that they would review

Table 2 Diagnosis offered by respondents to scenario 1 in box 2

Accordance with guideline	Diagnosis offered by health professional	GPs' responses		Midwives' responses	
		Frequency	%	Frequency	%
–	Pre-eclampsia	67	61.5	62	54.9
–	? Pre-eclampsia	20	18.3	9	8
†	Hypertension	4	3.7	4	3.5
†	Pregnancy induced hypertension	7	6.4	22	19.4
††	Mild non-proteinuric hypertension	1	0.9	1	0.9
–	Mild proteinuric hypertension	2	1.8	2	1.8
–	Proteinuric hypertension + UTI			2	1.8
–	Hypertension and borderline proteinuria	1	0.9		
–	Gestational hypertension + UTI			1	0.9
–	UTI			2	1.8
–	Mild pregnancy induced hypertension + proteinuria			2	1.8
–	More information needed	1	0.9		
–	Other	6	5.6	6	5.2
	Total	109	100	113	100

UTI=urinary tract infection.

Accordance with guideline: ††=completely in accordance with guideline; †=acceptable as in accordance with guideline; –=incorrect.

Table 3 Number (%) of respondents intending to admit or refer according to distance from specialist centre for scenario 1 in box 2

	≤50 miles		≥51 miles		Total
	GP	Midwife	GP	Midwife	
Admit					
Yes	21 (32%)	16 (20%)	23 (55%)	15 (43%)	75 (33%)
No	44 (68%)	66 (80%)	19 (45%)	20 (57%)	149 (67%)
Total	65	82	42	35	224*
Refer					
Yes	16 (25%)	32 (39%)	3 (7%)	6 (17%)	57 (25%)
No	49 (75%)	50 (61%)	39 (93%)	29 (83%)	167 (75%)
Total	65	82	42	35	224

*One case missing distance.

Mrs EF the next day. Only one or two respondents mentioned checks of maternal and fetal well being or blood tests.

Overall, the majority of GPs and midwives (132/224, 59%) recommended either admission (41% GPs, 26% midwives) or referral for specialist opinion and management (18% GPs, 32% midwives; table 3).

Similar management recommendations were offered for the woman in scenario 2 in box 2 (also illustrating mild non-proteinuric hypertension). Of 107 GPs and 117 midwives who provided a management plan for this patient, five GPs (5%) and seven midwives (6%) correctly described all the parts of basic surveillance according to the guideline. Although this scenario was clearly non-proteinuric, 33 GPs (31%) and 21 midwives (18%) said she should be admitted.

When asked in a telephone interview whether they had diagnosed mild non-proteinuric hypertension in the patient in scenario 1, seven of 17 respondents continued to recommend admission or referral outwith the recommended guidelines, but 10 said they might adopt a more "wait and see" approach.

Relation between planned management and distance from specialist maternity services for scenario 1

A significant association was found between increased distance of the practice from the specialist unit (≥51 miles) and the likelihood of planned admission. This relation was significant for all primary carers ($\chi^2=13.2$, $df=1$, $p<0.001$) and separately for GPs ($\chi^2=5.3$, $df=1$, $p<0.05$) and midwives ($\chi^2=6.9$, $df=1$, $p<0.01$; table 3). There was also a significant association between the distance of the practice from the nearest specialist maternity hospital and recommendation for referral. In this case referral was significantly more likely in the less distant practices (≤50 miles) ($\chi^2=11.7$, $df=1$, $p<0.01$) and separately for GPs ($\chi^2=5.3$, $df=1$, $p=0.02$) and midwives ($\chi^2=5.3$, $df=1$, $p=0.02$; table 3).

At interview most professionals said that their management of the patient in scenario 1 would have been the same if they had been located in a large city. One midwife (no 7822, ≥51 miles (>100 miles)) said she would be more likely to admit if in a large city centre but she was unable to explain her rationale for this answer. One GP said that the only difference about being located in a large city centre was:

"I would admit by road rather than by helicopter" (GP no 15911, ≥51 miles (>100 miles)).

Some, however, were unsure, stating:

"It would depend on what team support you had and what access to the hospital was like" (GP no 7211, ≤50 miles (10–25 miles)).

In relation to the interview item about how characteristics of their practice affected their management plan, a GP (no 11111, ≥51 miles (>100 miles)) suggested:

"The large distance to the centre for secondary care does mean that the practice of maternity care has to be more pro-active and more interventionist if we are not to take risks with the mother's health and that of her baby".

One midwife (no 15322, ≥51 miles (>100 miles)) highlighted the problem of specialist hospital staff not taking account of the location of the women, and putting too much emphasis on symptoms and their specialist interpretation of severity of illness, saying:

"On occasions, after discussing clients with increased BP with the maternity hospital, they are not particularly interested in admitting a patient unless her BP is over 100 diastolic and they often suggest treating clients conservatively at home. This is not always acceptable in an island location where weather is often too wild for air transport and can deteriorate rapidly in winter."

The same midwife's view of overcoming this problem was to have "a written policy agreed by all at maternity hospital and GPs". Another GP highlighted the difficulty of maintaining skills in remote settings:

"There is a constant barrage of guidelines which sometimes include things that are impossible to provide—we are never going to see 'x' numbers of 'y'. We can give patients an individual approach and plenty of time. National guidelines take no account of problems of island practice" (GP no 17411, ≥51 miles (51–100 miles)).

DISCUSSION

The results of this study highlight a lack of accuracy in the diagnosis of common hypertensive conditions in pregnancy. Most GPs and midwives appeared to overdiagnose the scenarios and, in reporting intended management, those most distant were more likely to admit and those less distant were more likely to refer to specialist hospitals. The practice of GPs or midwives in rural settings may diverge widely from a national guideline in the diagnosis and hence management of mild non-proteinuric hypertensive conditions during pregnancy.

The definition of "rural" practices adopted here was pragmatic but was stratified by distance from specialist services as a recognised key dimension of access to services. Future studies could seek to define rural sample selection more closely using practice attributes beyond population density and distance and should include an urban comparison group. We acknowledge that this was not a comparative prospective study of observed care delivered by urban versus rural practitioners. However, the magnitude of the inaccurate overdiagnosis of pre-eclampsia from scenario 1, with 59% of primary care staff intending to refer or admit, is of note and is a significant quality issue in maternity care in rural practices.

The observed overdiagnosis and intended management is similar to the cautious risk assessment by GPs reported by Armstrong *et al.*²⁸ When seeking consensus between obstetricians and GPs on draft guidelines for antenatal care in an urban health district, they found that GPs in the urban setting also favoured more conservative management than was suggested in draft guidelines for three conditions (anaemia, antepartum haemorrhage, and hypertension). In the management of hypertension they found a 10% level of unnecessary referral from urban GPs of women with oedema unassociated with proteinuria.²⁸ It has been suggested that rural locations at a considerable distance from specialist hospital care might further mitigate against accepting a "wait and see" approach.^{14 29}

Although caution is required in generalising from our small sample, the interview data substantiate questionnaire findings and provide some explanatory information. Some rural respondents did note their lack of knowledge, emphasised geographical barriers, and underlined the lack of consensus in risk assessment by highlighting perceived specialist indifference to borderline hypertensive conditions. Rural staff noted that constraints of remote location may be poorly understood by their urban or specialist colleagues and are disregarded in national guidelines.³⁰

Professionals in practices at greater distance were more likely to admit, and those at lesser distance were more likely to refer—both beyond the basic surveillance recommended, but

Key messages

- This study highlights a lack of accuracy in diagnosis from scenarios of the common condition of mild non-proteinuric hypertensive conditions in pregnancy by primary health-care professionals in rural areas.
- This may lead to excess referrals and admissions for specialist care that are inappropriate according to the guidelines.
- Possible explanations from subgroup interviews include lack of knowledge, a perception that constraints of rural context are disregarded in national guidelines, and contextual reasons for a more cautious approach to risk in management decisions in remote settings.
- Quality improvements could be sought by exploring locally developed and endorsed guidelines by all professions in maternity care teams, and stronger partnerships between specialist centres and primary carers to maintain skills and confidence in decision making by maternity care professionals in rural areas.

as a consequence of the apparent overdiagnosis of the severity of the hypertensive condition. The finding of more antenatal referrals/admissions is in accordance with other observations of maternity services in rural settings, with an effect for maternity services apparently in the opposite direction compared with studies demonstrating “distance decay” in the use of services for conditions such as cardiovascular disease.³¹ It is not possible to determine from our results whether this is a knowledge/training issue around diagnosis, a guideline implementation problem, disagreement with the guideline about illness severity, or magnified perception of risk in management decision making in a rural setting. However, 10 of 17 respondents at interview said their management would have been more conservative had they diagnosed “mild non-proteinuric hypertension”, suggesting that accuracy and confidence in diagnosis may be key. Interestingly, although no GP or midwife at interview explicitly mentioned issues around patient cost or utility of referrals or admissions (including allaying patient anxiety), intended management was consistent with acknowledging patient costs. Referral to a specialist outpatient or day centre at great distance may be impractical, so explaining the relation reported here between intention to admit and greater distance.

The “Framework for Maternity Services in Scotland” notes the need to be flexible and to develop practical solutions for rural areas.¹⁹ However, this should not imply poorer quality of care in terms of inappropriateness due to unnecessary referrals and admissions. This is especially important at a time when falling fertility rates in Scotland and workforce capacity issues may lead to further centralisation of maternity services.³²

Further research is required to explore the extent to which knowledge, beliefs, and risk perception in remote settings influence management decision making. We suggest that quality improvements could be sought by exploring locally developed guidelines endorsed by all professions in maternity care teams. Stronger partnerships between specialist centres and primary care professionals are required to develop and maintain skills and confidence in decision making by maternity care professionals in rural areas of Scotland.³²

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