Content of antenatal care services in secondary health care facilities in Nigeria: implication for quality of maternal health care

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Abstract

Objective. To assess the contents of antenatal care and to relate the findings to the adequacy of maternal health care.

Design. Cross-sectional study.

Setting. Public secondary health-care facilities.

Participants. Pregnant women.

Interventions. Three hundred and ninety consecutive pregnant women attending 12 selected secondary health facilities were recruited proportionate to the client load recorded for each facility during the year preceding the study. Interviews were conducted using the antenatal care exit interview form of the Safe Motherhood Needs Assessment package.

Main Outcome Measures. Antenatal care services provided to pregnant women in current pregnancy.

Results. Blood pressure measurement, abdominal palpation and detection of foetal heart rate were provided to all participants. Three hundred and eighty-six (99%) were reached with at least one educational message. One hundred and sixty-seven (42.8%) had haemoglobin or packed cell volume estimated, whereas 168 (43.1%) had urine checked for protein, at least once during antenatal visits. Routine iron and folate supplements, and malaria prophylaxis were, respectively, given to 142 (36.4%) and 25 (6.4%).

Conclusions. The antenatal care service as provided had reasonable capacity for intervention against pre-eclampsia and some foetal problems, and could contribute to delivery in a health facility and by a health worker. Capacity to address the possible effects of severe anaemia and malaria in pregnancy was lacking. Equipping health-care facilities with capacity to detect anaemia and proteinuria as well as ensuring that iron and folate supplements, and malaria prophylaxis are given to all pregnant women would help to meet national guidelines and improve quality of service.

Keywords: antenatal care, content, secondary health-care facilities, quality of care, Nigeria

Antenatal care is generally aimed at producing a healthy mother and baby at the end of any pregnancy [1]. It presents important opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well-being and that of their infants. The antenatal care period also provides a forum to supply information that may positively influence maternal and child health outcomes. Thus, it has been suggested that antenatal care could play a role in reducing maternal mortality [2] and that it could ensure that pregnant women deliver with the assistance of a skilled attendant [3].

In developing countries, maternal mortality ratio is estimated at 40–800 per 100 000 live births, about 200 times higher than that obtained in western countries [4]. Thus, antenatal care is arguably more important in developing countries because of the risks of malaria and anaemia in poorly nourished women, and risks of tetanus. Though studies on risk factors of maternal mortality have shown that the lack of antenatal care increases the risk of maternal mortality [5], risk assessment through antenatal care is not however by itself sufficient to reduce maternal mortality.

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Recent evidence has shown that maternal deaths could be reduced by promoting the availability, access and utilization of basic and comprehensive emergency obstetric care services for women with complications of pregnancy and childbirth [6].

Considerable variation exists in the content of antenatal care worldwide [7, 8]. This has probably led to the inconsistencies reported on the effectiveness of antenatal care on maternal mortality. The importance of antenatal care on neonatal outcome cannot, however, be over-emphasized as it has been linked to high birth weight and reduced neonatal tetanus [9, 10]. In Nigeria, antenatal care includes history of previous and current pregnancies, routine measurement of weight, height and blood pressure, abdominal palpation, nutritional advice, examination for the presence or absence of oedema, distribution of iron and folate supplements, malaria prophylaxis, blood testing for haemoglobin, urine testing for protein and tetanus toxoid vaccination [11].

Recent evidence has shown that some components of antenatal care, such as routine measurement of height and weight, and examination for the presence or absence of oedema, have not been found to have any impact in reducing the risk of serious complications and maternal deaths [12]. Furthermore, severe bleeding in pregnancy, which accounts for 24–28% of maternal deaths, has many causes; none of which can be eliminated through antenatal care [13]. World Health Organization recently advocated that only examinations and tests serving an immediate purpose and proven to be beneficial should be performed during antenatal visits [14]. These examinations should include, at a minimum, measurement of blood pressure, testing of urine for bacteriuria and proteinuria, and blood tests to detect syphilis and severe anaemia [15].

However, implementing this recommendation has far-reaching implications in resource-limited settings that are also usually characterized by conditions threatening pregnancy and its outcome. First, although the approach can help to save costs and improve efficiency, its effectiveness in improving maternal and child health outcomes may be limited due to exclusion of interventions addressing other conditions prevalent in those settings. Secondly, it could consequently result in low quality health service. This study therefore assessed the content of antenatal care services as provided at public secondary health-care level and related the findings to its adequacy. The study highlighted the weaknesses of antenatal care services and provided suggestions that could be useful in strengthening the service and hence improving the quality of maternal health care.

Methods

This was a cross-sectional descriptive study of public secondary health facilities in Osun zonal area of southwest Nigeria. There are 54 of such facilities, out of which 33 were providing antenatal and delivery services to a total population of ∼2.9 million. These include 11 hospitals and 22 comprehensive health centres. By simple random selection, six hospitals and six comprehensive health centres were studied. A sample size of 316 was derived from Leslie–Kish formula $(n = Z_{\alpha}^{2} pq / d^{2})$ for descriptive studies and using 29% as the proportion of pregnant women, who use antenatal care services in developing countries [16].

Prior to field work, approval to conduct the study was sought and received from the Joint University of Ibadan/University College Hospital ethical committee as well as the appropriate government authorities. Subsequently, records of antenatal clinic days and pregnant women seen in all the selected facilities during the preceding year (January–December 2001) were obtained from the statistics unit of the hospitals management board, which oversees all health facilities in the study area. A proportionate sampling was carried out to obtain the number of respondents required for recruitment in each facility. Exclusion criteria included history of referral to the selected health facilities and history of receiving care at another health facility in the current pregnancy.

All consecutive pregnant women seen on a day of field visit to any of the selected health facilities were included in the study until the required number was obtained. When the required number could not be obtained during the first visit, such a facility was re-visited until the required number was obtained. Interviews were conducted by four trained research assistants under close supervision of the investigators. For the purpose of clarity of expression and comprehensibility of solicited information, interview was conducted in either English or local language, *Yoruba*, depending on which each respondent indicated her versatility. Respondents' privacy was respected and confidentiality of information was ensured during field work.

Antenatal care exit interview form of the Safe Motherhood Needs Assessment package was used to obtain information on services received by the pregnant women, who were interviewed just before they exited the facility [17]. Respondents were asked whether they received the following services on the day of interview: blood pressure measurement, abdominal palpation and detection of foetal heart rate. In addition, information was collected on whether they had ever received any of the following services, at least once, during antenatal visits in the current pregnancy: history of previous and current pregnancies; health education; blood samples taken for haemoglobin or packed cell volume estimation and syphilis test; urine samples taken for proteinuria and bacteriuria; distribution of iron and folate supplements and malaria prophylaxis.

The instrument was devoid of information with regard to tetanus toxoid injections received. To validate the data generated through the exit interview form, each respondent was requested to bring out her antenatal card; the records of which were used to check the responses to the questions for correctness. The principle of auditing was observed during this process such that if a service was not recorded, it was assumed that it was not provided even if the respondent claimed otherwise.

Data analysis

Data entry and analysis were done with Epi-info version 6 software, while the format of Safe Motherhood Needs

Assessment forms was used to generate data spreadsheets. Respondents were categorized into three: those who booked in first, second or third trimester; arithmetic means and standard deviations were calculated for each category with respect to the number of services received and Student's *t*-test was used to compare the means. Chi-square test was used to compare proportions.

Results

A total of 390 pregnant women participated in the study. Their ages ranged from 17 to 43, with a mean of 26.3 ± 2.1 years. Most participants, 216 (55.4%), were literate in both English and local *(Yoruba)* languages, whereas 144 (34%) were literate only in *Yoruba* language. Out of the 390 pregnant women, 284 (72.8%) and 106 (28.2%) were recruited from the hospitals and comprehensive health centres, respectively. Antenatal records were available and used to verify responses in all, but one respondent. Among those with antenatal records, consistency rate was 92%, i.e. 358 respondents while adjustments were made to some responses given by 31 (8%) of the respondents.

Mean gestational age at booking was 22.6 ± 5.6 weeks. Majority of the respondents, 279 (71.5%), were in their second trimester at the time of booking, whereas 83 (21.3%) and 28 (7.2%) booked in their third and first trimesters, respectively. The number of services provided to pregnant women ranged from 3 to 12, with a mean of 8.7 ± 1.6 services. Pregnant women who booked in their third trimester have a significant higher mean number of services, 9.1 ± 1.4 than those who booked in the first trimester, 8.5 ± 1.5 ($P = 0.03$; 95% Confidence interval (CI) $= -1.2$ to -0.04) and those who booked in the second trimester, 8.6 ± 1.6 ($P = 0.003$; 95% CI $= -0.9$ to -0.2).

In both categories of facilities, blood pressure measurement, abdominal palpation and detection of foetal heart rate services were provided to all the respondents. History of previous and current pregnancies was taken in 248 (87.3%) and 98 (92.5%) of pregnant women seen, respectively, in hospitals and comprehensive health centres. Table 1 shows the health education content of the antenatal care service. Health workers were reported to have discussed importance

of nutrition in pregnancy and place of delivery with more pregnant women in hospitals, 282 (99.3%) and 278 (97.9%) than in comprehensive health centres, 104 (98.1%) and 92 (86.8%) ($P = 0.29$, <0.001), respectively. Similarly, more pregnant women were reached with information on family planning/child spacing 274 (96.5), child care 263 (92.6), HIV/AIDS and other sexually transmitted diseases 262 (92.3), benefit of delivery in a health facility 263 (92.6) and what to do if there is a problem during pregnancy 250 (88.0) in hospitals than comprehensive health centres.

Haemoglobin estimation or checking for packed cell volume and urine analysis for protein were the only laboratory investigations carried out among the pregnant women. Table 2 shows that less than half of the participants, 167 (42.8%), had either haemoglobin or packed cell volume estimated. These consisted of 137 (48.2%) and 30 (28.3%) of those seen in hospitals and comprehensive health centres, respectively ($P < 0.001$). Similarly, 168 (43.1%) pregnant women had their urine checked for protein. They consisted of 138 (48.6%) and 30 (28.3%) of those seen in hospitals and comprehensive health centres, respectively ($P < 0.001$). Routine iron and folate supplements, and malaria prophylaxis were given to 142 (36.4%) and 25 (6.4%) pregnant women, respectively. A total of 115 (40.5%) and 27 (25.5%) of those seen in hospitals and comprehensive health centres, respectively, received iron and folate supplements ($P = 0.006$), while 12 (4.2%) and 13 (12.3%) of those seen in hospitals and comprehensive health centres received malaria prophylaxis ($P = 0.29$).

Discussion

The importance of assessing the content of antenatal care as a measure of quality of process of maternal health care cannot be underscored. However, the usefulness of each component of antenatal care services in reducing maternal morbidity and mortality had been a subject of debate [3]. In this study, the gestational age at first antenatal visit seemed to influence the quality of care as those who booked in their first and second trimesters received significantly fewer services than those who booked in the third trimester. This finding is surprising as such practices can be counter-productive because antenatal care will only provide opportunities for appropriate and

Table 1 Health education content of antenatal care service

Content	Hospitals No. (%)	Health Centres No. (%)	Total No. (%)	*P*-value
Diet and nutrition	282 (99.3)	104 (98.1)	386 (99.0)	0.29
Place of delivery	278 (97.9)	92 (86.8)	370 (94.9)	<0.001
Family planning/child spacing	274 (96.5)	93 (87.7)	367 (94.1)	0.001
Child care	263 (92.6)	97 (91.5)	360 (92.3)	0.71
HIV/AIDS and other STDs	262 (92.3)	94 (88.7)	356 (91.3)	0.26
Benefit of delivery in health facility	263 (92.6)	85 (80.2)	348 (89.2)	<0.001
Advice on what to do if there is a problem during pregnancy	250 (88.0)	82 (77.4)	332 (85.1)	0.008
Total	284 (100)	106 (100)	390 (100)	

Table 2 Laboratory services and drug treatment provided at antenatal care service

Services provided	Hospitals No. (%)	Health Centers No. (%)	Total No. (%)	P-value
Haemoglobin estimation	137 (48.2)	30 (28.3)	167 (42.8)	<0.001
Urine analysis for protein	138 (48.6)	30 (28.3)	168 (43.1)	<0.001
Iron and folate supplements	115 (40.5)	27 (25.5)	142 (36.4)	0.006
Malaria prophylaxis	12 (4.2)	13 (12.3)	25 (6.4)	0.29
Total	284	106	390 (100)	

effective intervention if risk factors are identified as early as possible in pregnancy. The service providers might presumably be catching up on services which ought to have been provided earlier and therefore doing more for them during their index visit in third trimester.

All the pregnant women in this study had their blood pressure checked in both categories of health facility, which agreed with the WHO recommendation [15]. This component of antenatal care is used to screen for hypertension, which acts as an early and detectable sign of toxaemia [18]. Abdominal palpation and detection of foetal heart rate were routinely conducted in the facilities as all the pregnant women were also provided with the services. This trend is expected and commendable in a setting in which this study was conducted as there was no available, in all the selected facilities, state-of-art equipment such as an ultra sound scanner, which could easily be used to monitor foetal position and wellbeing. Little difference between manual and electronic procedures had, however, been reported in the literature, both producing over 50% false positives [19].

History of current pregnancy is essential at any visit; however, this was not the case in 11.3% respondents. The reason for this inadequacy could not be easily explained. This study showed that pregnant women were widely reached with health education content at one point or the other during antenatal visits, but more in hospitals than comprehensive health centres. This component is vital for all attendees as it provides avenue to give information positively influencing maternal and child health outcomes, including delivery by a trained health worker [3]. The reason for <100% coverage of this component may be attributed to shortage of trained staff reported on another study instrument.

All the facilities were deficient concerning provision of basic and minimum examinations required to be carried out on blood and urine. Less than half of the pregnant women had their blood and urine checked for haemoglobin estimation or packed cell volume and protein, respectively, at least once during antenatal visits. This finding corroborated earlier report that local facilities often lack the capacity to measure anaemia [8, 20]; this limitation will probably explain the inadequacies observed in the capacity to carry out other tests such as syphilis test and bacteriuria. It should be noted, however, that the testing for anaemia can be done very cheaply and reliably at local level and prophylaxis is not expensive. An observational checklist of available equipments and supplies in the health facilities would have further confirmed these findings.

The importance of screening for anaemia in a developing country cannot, however, be over-emphasized where two-thirds of pregnant women have been reported to suffer from anaemia and that anaemia is often the underlying cause of maternal mortality [21]. On the other hand, the usefulness of proteinuria is downplayed as it is a late sign in the development of pre-eclampsia, although it becomes significant if it co-exists with hypertension [22]. In Nigeria, 0.3% was reported as the national prevalence of syphilis among pregnant women [23]; this suggested that syphilis is uncommon partly because of considerable use and abuse of antibiotics, which are easily purchased across the counter [24]. This finding might readily explain the exclusion of routine test for syphilis and bacteriuria as components of antenatal care services in the facilities.

The aim of giving iron and folate supplements and malaria prophylaxis routinely at antenatal visits in developing countries is to maintain stores throughout pregnancy and prevent severe anaemia [25, 26]. This is due to the fact that the causes of anaemia are multifactorial and include nutritional deficiency of iron and folate, malaria, sickle cell disease, intestinal parasites, infections, blood loss and poor socio-economic conditions [27]. Furthermore, malaria prophylaxis is meant to mitigate the complications of malaria in pregnant women thus improving maternal health and foetal outcomes [15].

Therefore, the aim of this intervention among the study population could not have been achieved considering the findings, where only 36.4% and 6.4% of pregnant women received iron and folate supplements, and malaria prophylaxis, respectively, in the current pregnancy. The fact that many pregnant women in Nigeria receive antenatal care in more than one health facility might partly be responsible for these findings [28]. In addition, some may prefer fixed dose combination capsules, which are readily available across the counter at cheap prices. This might have resulted in refusal of iron and folate supplements, and malaria prophylaxis in one health facility because the drugs have been received or purchased elsewhere.

An attempt was made to downplay the effect of this practice by excluding those with a history of referral from another health facility and those with a history of receiving care or drug elsewhere in the current pregnancy. However, total exclusion of this group of women might not have been possible. National health ministry recommended that pregnant women receive intermittent preventive therapy of two doses of sulfadoxine-pyrimethamine during second and early in the third trimester of pregnancy [29]. Despite this, previous national surveys in Nigeria had reported similar trends of

partial implementation of preventive interventions, where 60 and 20% of antenatal care users received iron supplements and malaria prophylaxis, respectively [11]. Direct observation and/or interviews of health workers could have further validated these findings, but were beyond the scope of this study.

Conclusion

There were inadequacies in the content of antenatal care services as provided at the secondary health-care facilities in the study area. The screening services and care only had reasonable capacity to provide opportunities for prompt intervention against pre-eclampsia and early detection of some foetal problems. The services would also improve pregnancy outcome by ensuring that women deliver in a health facility and by a trained health worker. The contents of antenatal care services were deficient in capacity required for prevention, early detection and prompt treatment of severe anaemia; detection of long-standing pre-eclampsia and prevention of complications of malaria in pregnancy. All of these contribute significantly to maternal morbidity and mortality in developing countries.

The exclusion of tests for syphilis and bacteriuria on a routine basis may be justified because of the pattern of use of antibiotics in this setting. It is recommended that all facilities at this level of care, especially the comprehensive health centres, be equipped with capacity to detect anaemia and proteinuria in order to improve the quality of antenatal care services. Furthermore, iron and folate supplements in pregnancy should be intensified while health workers are encouraged to adhere to the national health ministry's recommendation on malaria prophylaxis in pregnancy. Evaluation study of these interventions on quality of maternal health service is suggested. Such study should be designed to include direct observation of antenatal care process and interviews of health workers as means of near complete validation of generated data.

Acknowledgement

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