Research Article

Screening and Referral for High Risk Pregnancies Among Primary Health Care Workers in Rural Communities in Abia State, Nigeria

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Abstract

Introduction: Screening for conditions like hypertension, diabetes mellitus and anaemia during antenatal reduces the chances of complications in pregnancy. Health systems in Nigeria are structured such that cases that cannot be managed in a lower health facility are referred to higher hospitals with more expertise and equipment. This study was conducted to determine the screening and referral patterns of high risk pregnancies among health workers in rural communities in Abia state, Nigeria.

Materials and Methods: This was a descriptive cross-sectional study conducted among 400 staff of Primary Health Care Centres in the three senatorial zones of Abia state, Nigeria from January to June, 2021. Primary health centres were grouped using cluster sampling while selection of the respondents was by simple random sampling by balloting. Quantitative and qualitative methods were used to collect data. Data analysis was done using SPSS version 21.0 and results presented in tables.

Results: Two hundred and sixty-seven (67.3%) respondents knew that gestational diabetes mellitus was associated with pregnancy while 385 (96.3%) screened for gestational diabetes mellitus on first day of antenatal care visit. Three hundred and forty-three (85.7%) respondents screened for hypertension in pregnancy during antenatal. All respondents, 400 (100.0%) knew that anaemia could lead to abortions. Three hundred and thirty-three (83.3%) respondents referred difficult cases to higher facilities, while 49 (12.2%) invite doctors to their facilities. Challenges with referrals include lack of facility ambulances, lack of access roads and lack of funds.

Conclusion: Health facilities are not equally equipped to handle high risk pregnancies. Also, health workers are not competent to manage high risk pregnancies. Referral strategies and protocols are lacking in the health facilities studied.

Keywords

High-risk pregnancies, Screening, Referrals, Primary health care workers, Rural, Abia state

Introduction

Pregnancy is deemed high- risk if there are underlying health or non-health conditions that might be potential or actual risks to the mother or fetus [1]. Pre-existing health conditions in the mother, fetus or pregnancy could predispose the mother or fetus to complications leading to poor outcomes. Conditions such as extremes of maternal age have been shown to put the mother or fetus at high risk of poor pregnancy outcomes [2,3]. Other maternal conditions as chronic blood pressure, diabetic mellitus, anaemia and cardiac disease in the mother lead to increased risk of pregnancy complications [4,5]. Congenital defects, multiple gestations and fetal growth restrictions create a high risk pregnancy. Any factor causing pregnancy to be termed 'high risk' predisposes a woman to higher complications during pregnancy, childbirth and postpartum [6]. Conditions which lead to high-risk pregnancies have been shown to likely to re- occur in subsequent pregnancies [7]. About 20 million women have high risk pregnancies, and more than 800 babies die daily from perinatal causes [8]. These deaths are common among the poor, and those who live in rural communities. Early diagnosis and management of high-risk pregnancies prevent complications. Assessment for high risk cases starts from the

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first day of antenatal registration throughout the pregnancy. Positive pregnancy outcomes depend on the quality of antenatal care received [9]. The World Health Organisation [10,11] recommended guidelines for improving quality of antenatal care and early assessment for high-risk pregnancies and complications. These are guides for use by skilled health attendants at any level of health care. Effectiveness of these guidelines further depends on level of manpower, availability of equipment and drugs and capability of health worker in managing high-risk pregnancies. Limitations in providing care to women with high-risk pregnancies are prevalentin poor resource settings [12,13]. Health workers in facilities with limitations in managing pregnancy complications should refer to higher health facilities with capacity to deliver expert services to the woman.

Nigeria operates three levels of health care- primary, secondary and tertiary levels. Health service delivery are carried out at each level. The primary level is the first point of contact with the health system while the tertiary level assumes the highest level of care. Every state in Nigeria operates the three levels of health care. Primary health care services are closer to the rural communities. The three levels differ in the scope of service delivery, facilities and manpower. Whereas, the primary level of care delivers basic health services within the competencies of staff in each facility, the tertiary level handles more difficult and technical cases requiring higher expertise and equipment. The secondary level occupies a middle role between the primary and tertiary health care. In the design of the three-tiers of health care, these three are in continuous communication in patient care. The organisation of service delivery in Nigeria into three levels is intended to rationalise the delivery of health care by way of referral between these levels of health care for effective use of existing resources [14]. A referral system is a mechanism to enable comprehensive management of clients' health needs through resources beyond those available where they access care [15]. The referral system is based on the premise that while capacity for health service delivery needs to be rationalised for different levels of care, health services should not be determined by only the services available at the point of access, but rather by the full scope of care that the health system can provide without undue burden to the client either by way of long distance journey to access a higher level of care or undue financial burden. An effective referral chain, therefore provides the linkages needed across different levels of health care delivery system. These linkages ensure that a client's health needs can be addressed regardless of the level of the health system where the client physically accesses care. A well-defined referral system will improve the focus and quality of service networking of providers and facilities at the different levels of the health care to ensure continuity of care to clients that need services provided at higher levels of the health care system [16,17]. Understanding the importance of referrals in preventing maternal death is key to improving Nigeria's maternal and perinatal health indices. This study therefore adds to the body of few literature determining management and referral of high risk pregnancies in primary health care facilities in Abia state.

Materials and Methods

This was a descriptive cross-sectional study conducted among 400 staff of Primary Health Care Centres (PHCs) in the three senatorial zones of Abia state, Nigeria from January to June, 2021. Abia state is one of the 36 states in Nigeria located in the south-eastern part of the country. It is divided into 3 senatorial zones- Abia North, Abia Central and Abia south with 292 political wards. There are 722 PHCs located in the 292 political wards across the 17 Local Government Areas (LGAs) of the state. The study participants were community health workers in the selected PHCs.

The sample size was determined using the formula

$$n = \frac{Z^2 P^2 q}{d^2}$$

Where

n= minimum sample size

Z= standard normal derivative (1.96)

P = proportion of desired attribute

q = 1-P

d = desired level of precision (0.05)

And

Z =1.96

P = 50%

q = 1-P = 0.5

d =0.05

Therefore ; $N = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$

$= \left(\frac{0.964}{0.0025} \right)$

= 384.16

Sample size was rounded up to 400 after adjusting to attrition and loss to follow-up.

The list of all 722 PHCs and their distribution across the political wards were obtained from the state primary health care development agency. Cluster sampling method was used to group health centres within the three geo-political zones. Each zone was visited by the researcher and further clustering the PHCs in each zone. Only PHCs that run active maternity services and located in rural communities were selected to participate in the study. A total of 200 PHCs were thus selected for the study. Using simple random sampling technique, 2 health workers were selected from each health facility after informed consent was obtained. Quantitative data was collected by the use of semi-structured questionnaires while qualitative data used key-informant interviews for data collection. Questions on screening and knowledge of high-risk pregnancies were asked. Information on management and referral practices were also obtained from the health workers. Data collected was analysed using SPSS software version 21.0 and presented in frequency tables.

Ethical approval was obtained from the research and ethics committee of Abia state university teaching hospital.

Informed consent was also obtained from the respondents after study objectives were explained to them. Only health workers who volunteered to participants in the study were enrolled.

Table 1 shows socio-demographics of respondents. Majority of the respondents, 97 (24.2%) were in 41-45 age range while those above 50 years were the least, 40 (10%). A total of 101 (25.3%) of the respondents had worked for a period between 11-15 years.

Table 2 shows responses of respondents on screening for diabetes mellitus. Two hundred and sixty-nine respondents (67.3%) knew the term gestational diabetes was associated with pregnancy. Increased maternal age and history of polycystic ovarian disease got low responses (39.3% and 16.5% respectively) on knowledge of being risk factors to development of gestational diabetes. On screening for diabetes, 385 (96.3%) respondents were aware that screening is done on first day of antenatal visit.

Table 3 shows screening for pregnancy-induced hypertension among respondents. Three hundred and ninety-five respondents knew that blood pressure is measured with a sphygmomanometer. Normal ranges for systolic and diastolic blood pressures as well as knowledge of protein in urine as a warning sign was known by 343 (85.7%) of the respondents.

Table 4 shows screening for anaemia among respondents. All the respondents, 400 (100%) knew that iron supplements

Table 1: Socio-demographic characteristics of respondents.

Variable	Frequency	Percentage (%)
Age (years)		
≤ 30	46	11.5
31-35	65	16.3
36-40	84	21.0
41-45	97	24.2
46-50	68	17.0
> 50	40	10.0
Total	400	100.0
Sex		
Male	62	15.5
Female	338	84.5
Total	400	100.0
Marital status		
Single	143	35.7
Married	134	33.5
Widowed	68	17.0
Divorced	55	13.8
Total	400	100.0
Duration of work (years)		
≤ 10	30	7.5
11-15	101	25.3
16-20	77	19.2
21-25	92	23.0
26-30	42	10.5
31-35	58	14.5
Total	400	100.0

Table 2: Screening for Diabetes Mellitus among respondents.

Variable (Questions)	Frequency N=400	
	Yes (%)	No (%)
What is Gestational diabetes mellitus(GDM)		
Diabetes Mellitus first detected in pregnancy	269 (67.3)	131 (32.7)
Risk factors associated with diabetes mellitus include		
Increased maternal age	157 (39.3)	243 (60.7)
Obesity	203 (50.8)	197 (49.2)
Previous history of GDM	287 (71.8)	113 (28.2)
Polycystic ovarian disease	66 (16.5)	334 (83.5)
In screening for GDM		
All pregnant women are tested for GDM on the first day of ANC	385 (96.3)	15 (3.7)
High risk women are screened more frequently	203 (51.0)	197 (49.0)
Urine glucose test confirms GDM	184 (46.0)	216 (54.0)
Fasting blood glucose of >126mg confirms GDM	197 (49.2)	203(50.8)
Oral glucose tolerance test confirms GDM	313 (78.3)	87 (21.7)
Pregnant women with GDM are tested daily	313 (78.3)	87 (21.7)

Table 3: Screening for Pregnancy-induced hypertension among respondents.

Variable	Frequency N=400	
	Yes (%)	No (%)
Pregnancy-induced hypertension (PIH) is detected first in pregnancy	272 (68.0)	128 (32.0)
Blood pressure is measured with a sphygmomanometer	395 (98.8)	5 (1.2)
Screening for PIH is done at every ANC visit	217 (54.2)	183 (45.8)
A systolic blood pressure of 140mmHg and above is abnormal	343 (85.7)	57 (14.3)
A diastolic blood pressure of 90mmHg and above is abnormal	343 (85.7)	57 (14.3)
Protein in urine is a warning sign for pre-eclampsia in pregnant women	343 (85.7)	57 (14.3)

Table 4: Screening for anaemia among respondents.

Variable	Frequency N=400	
	Yes (%)	No (%)
Anaemia in pregnancy can be detected clinically	249 (62.2)	151 (37.8)
Haemoglobin blood test confirms diagnosis of anaemia in pregnancy	358 (89.5)	42 (10.5)
Iron supplements are given to pregnant women whether anaemic or not	400 (100.0)	
Nutrition can affect iron blood level in pregnant women	400 (100.0)	
Anaemia in pregnancy can lead to abortions	400 (100.0)	

Table 5: Management of high-risk pregnancies among respondents

Variable	Frequency	Percentage
Competent skills	**'Yes' only**	
Do you think you have the competent skills to detect cases of high risk pregnancies	101	25.3
Required tools/equipment for		
Blood pressure measurement	400	100
Urine glucose test	375	93.8
Fasting blood sugar	123	30.7
Oral GTT	5	1.2
Haemoglobin test	13	3.3
Urine protein	381	95.2
Management of high-risk pregnancies		
Manage uncomplicated cases through ANC	210	53.0
Deliver uncomplicated cases	137	34.3
Refer to higher hospitals	333	83.3
Invite the services of a doctor	49	12.2

were given to pregnant women whether anaemic or not. All of them also knew that nutrition can affect iron blood level in pregnant women and that anaemia in pregnancy can lead to abortion.

Table 5 showed management of high-risk pregnancies among respondents. One hundred and one respondents (25.3%) deemed themselves competent to detect conditions associated with high-risk pregnancies. All the respondents had the required equipment for blood pressure measurement. Only 5 (1.2%) respondents have the equipment for oral glucose tolerance test (Oral GTT). Three hundred and thirty-three respondents (83.3%) respondents referred patients to higher hospital, 210 (53.0%) manage uncomplicated cases through antenatal period while 49 (12.2%) of the respondents invite the services of a doctor.

Result of key-informant interviews

Availability of necessary drugs

On availability of necessary drugs, many health care workers did not have regular supply of drugs in the health facilities. One of the respondents said'

"we don't usually have drugs in constant supplies here"

When asked how they sourced their medicines and what happens when they had stock-outs, one responded thus

'We get our medicines from the headquarters a well as support from philanthropists'. When we are out of stock, we either use our money to buy and sell to the patients or ask the patients to buy themselves'.

When we are out of stock, it further limits our capabilities to take care of our patients.

Challenges with patients' referrals

Most of the respondents referred out high-risk cases to higher hospitals. Some responses regarding referrals were '

I refer complications to mainly private hospitals around here'.

When further asked why referrals were made to private hospitals instead of government hospitals. The responses were 'we refer to private hospitals because the general hospitals are always on strike while the federal medical centre is so far from us'

Some challenges encountered during referrals as mentioned by the staff;

'Referral of patients from here is faced with challenges such as lack of ambulances to move the patients. 'Our health centres do not have ambulances to convey patients to other health facilities', one responded.

They have to use tricycles on some occasions to move patients to hospitals. Accessible roads were another factor faced by pregnant women in moving to referral hospitals.

Our findings also showed that health care workers do not have funds to communicate with referral hospitals. This limits feedback from the hospitals thereby hindering follow-up and continuity of care.

Discussion

Women with high risk pregnancies have high risks of maternal and neonatal deaths [18]. This study focused on screening and referral for hypertension, gestational diabetes mellitus and anaemia as conditions that predispose to maternal and neonatal complications in pregnancy. This is in keeping with reports that these health conditions are the most common and critical in women of child bearing age [19]. Results from this study show some gaps in the knowledge and management of high risk pregnancies. Hypertension, diabetes and anaemia in pregnancy are the commonest health conditions seen in pregnant women [20-22]. Being common disease conditions especially as it affects pregnant women, it is expected that health workers should be knowledgeable in the care and management of these disease conditions. Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy [23]. The word gestational added to diabetes mellitus simply shows it's a type of diabetes that is seen only in pregnancy. This study showed that only 269 (67.3%) of the respondents knew this definition. Early identification of risk factors associated with diabetes mellitus in pregnancy could prevent complications in pregnancy. Risk factors as increased maternal age, obesity, polycystic ovarian disease and a previous history of gestational diabetes mellitus should be on the watch list of health workers during antenatal care. However, this study showed some deficiencies in identifying risk factors for GDM. These findings are similar to previous studies elsewhere [24,25]. Screening all pregnant women for GDM is a routine practice during antenatal visits in Nigeria. Pregnant women are tested on first day of registration and on every visit if she is high risk. Oral glucose tolerance test confirms diagnosis of GDM [25]. This study showed more than half the number had basic information on screening for GDM. Responses on hypertension from the health workers were above average as more than half of the respondents knew when to measure blood pressure and the instrument used in the measurement. They were also aware of the

normal and abnormal blood pressure readings and the warning sign of having protein in the urine of a pregnant woman. This is expected as blood pressure is the commonest vital measurement taken in a health facility. Unavailability and faulty sphygmomanometer for blood pressure measurement were some reasons for non- measurement of blood pressures in pregnant women and other patients in the hospital. Hypertensive disease of pregnancy is among the leading causes of maternal and neonatal deaths [6]. It is therefore important for health care workers to be aware and able to detect cases of hypertension with possible follow-up for detection of risk factors such as family history, kidney disease, age, previous history, diet, obesity, diabetes mellitus [22]. Anaemia as a high risk pregnancy condition accounts for 50% of maternal deaths [26]. A pregnant woman with haemoglobin (Hb) level of less than 11g/dl is diagnosed to be anaemic [27]. In Nigeria, anaemia in pregnancy is common. A national anaemia estimate of 41.8% was reported by the WHO while a lower prevalence of 20% was reported among pregnant women in Lagos university teaching hospital, Nigeria. Anaemia is considered a significant health problem if its prevalence in a study population is 5% and classified a severe public health problem if ≥ 40% in a population [28]. Health workers in this study were knowledgeable on identification and management of anaemia in pregnancy. This is not surprising considering how common anaemia presents in pregnancy especially in rural communities. This finding is similar to that conducted in India. Management of high risk pregnancies requires competent work force, the right tools and equipment for diagnosis as well as drugs and logistics for referral when needed. The results from this study revealed that the health workers were not competent and did not have the right tools and equipment for diagnosis and management of high-risk pregnancies. This finding is similar to that conducted in rural communities in India [29]. In managing high risk cases, the respondents in this study could manage uncomplicated pregnancies. They invited higher skilled personnel by way of referral to higher health facilities or invitation to their health facilities. A functioning referral system is generally considered to be a necessary element of successful Safe Motherhood programmes. Requisites for successful maternity referral systems include: a referral strategy informed by the assessment of population needs and health system capabilities; active collaboration between referral levels and across sectors; formalised communication and transport arrangements; agreed setting-specific protocols for referrer and receiver; supervision and accountability for providers' performance; affordable service costs; the capacity to monitor effectiveness and policy support [30]. The results from this study show quite a number of respondents (83.3%) refer their patients to higher hospitals. However, there were challenges in the referral process. The respondents in the key informant interviews said they lacked ambulances to move patients to referral hospitals. They resorted to hiring tricycles which had delays in arrival. Others had access roads as one of the challenges faced in referrals. The health workers in this study did not have clear-cut protocols for referrals which placed a major challenge in communication with the receiving hospital. These findings were similar to other studies carried out in developing countries [30,31].

Study limitations

This study had few limitations. Information received on knowledge should have been scored to objectively assess the knowledge level of respondents. Also on practice, respondents were assessed by questions instead of observation. The respondents would have over stated or under-stated their practices. However, our findings were consistent with findings from other studies.

Recommendations

The following recommendations were made after the study

Health workers should undergo regular trainings to develop and enhance competencies.

Health facilities should have the basic diagnostic tools for detecting high risk pregnancies.

Drugs should readily available in all health facilities.

The health systems referral network should have protocols made known to all health workers.

There should be available ambulances in health facilities.

Conclusion

This result from this study shows that health facilities are not equally equipped to handle high risk pregnancies. Health workers are not competent to manage high risk pregnancies. Referral strategies and protocols are lacking in the health facilities studied.

Competing interest

None

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