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Massive Ascites Complicating Incidence & Fetomaternal Outcome

Highlights

Biochemical Markers and Uterine Incidence, Clinical Characteristics

Discovering Thoughts, Inventing Future

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Incidence and Fetomaternal Outcome of Eclampsia in a Tertiary Medical College Hospital in Bangladesh

By Kamrun Nessa, Sanjida khan, Selina Begum, Ferdowsi Sultana & Tania Akbar

Enam Medical College & Hospital

Abstract- *Background:* In day to day obstetric practice, the incidence of eclampsia and its complication is high. It is one of the leading causes of maternal mortality in Bangladesh accounting about 20%. This is also associated with poor perinatal outcome.

Objectives: To determine the incidence of eclampsia and associated feto-maternal outcome.

Materials and Methods: A retrospective study was conducted on the diagnosed patients of eclampsia admitted in Enam Medical College and hospital, Dhaka, Bangladesh, during the period of January 2015 to December 2016. During these years total 2295 patients were admitted in obstetrics unit among them 35 patient were admitted with eclampsia. Analysis done regarding age of women, parity, type of eclampsia, gestational age of delivery, mode of delivery, maternal and fetal outcome. Patients with convulsion and or coma due to other causes were excluded. Study was ethically approved by Ethical Review committee of Enam Medical College and Hospital. All data were entered in SPSS16 and also analyzed through it.

Keywords: *eclampsia, perinatal death, preterm delivery.*

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Incidence and Fetomaternal Outcome of Eclampsia in a Tertiary Medical College Hospital in Bangladesh

Kamrun Nessa [α], Sanjida khan [σ], Selina Begum [ρ], Ferdowsi Sultana [Ѡ] & Tania Akbar [¥]

Abstract- Background: In day to day obstetric practice, the incidence of eclampsia and its complication is high. It is one of the leading causes of maternal mortality in Bangladesh accounting about 20%. This is also associated with poor perinatal outcome.

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Results: Total admitted patients in obstetrics unit during the given time period were 2295. Among them 35(1.52%) were eclampsia. Among eclampsia patients more than half that is 19(54.28%) were in between age of 21 to 30 years of age. Most 21(60%) were nulliparous and 14(40%) were multiparous.15 (42.85%) were antepartum eclampsia whereas 20(57.14%) were postpartum. Maximum 22(62.85%) delivered preterm. Mode of delivery by caesarean section 24(68.57%) is more than double of vaginal delivery. Maternal outcome was good after treatment in eclampsia ward in 18 (51.42%) cases, whereas 14 (40%) needed ICU support and 3 (8.57%) died in hospital. Most of the babies were born preterm low birth weight (37.14%) and perinatal deaths were 20%. Only 6 babies were term and healthy.

Conclusion: Our observation states postpartum eclampsia is more common in nulliparous between 21-30 years of age with preterm delivery and poor fetomaternal outcome.

Author α: Professor, Department of Obstetrics & Gynecology, Enam Medical College & Hospital, Dhaka, Bangladesh.
e-mail: knessa3@gmail.com
Author σ: Assistant Professor, Department of Obstetrics & Gynecology, Enam Medical College & Hospital, Dhaka, Bangladesh.
e-mail: sanjida.jimch@yahoo.com
Author ρ: Classified specialist, Department of Obstetrics & Gynecology, Combined Millitary Hospital, Comilla, Bangladesh.
e-mail: selinabegum101101@yahoo.com
Author Ѡ: Registrart, Department of Obstetrics & Gynecology, Enam Medical College & Hospital, Dhaka, Bangladesh.
e-mail: drfspoly@gmail.com
Author ¥: Assistant Professor, Department of Obstetrics & Gynecology, Enam Medical College & Hospital, Dhaka, Bangladesh.
e-mail: taniaakbarfcps@gmail.com

Keywords: eclampsia, perinatal death, preterm delivery.

I. Introduction

Now a days Eclampsia is one of the leading cause of maternal and perinatal mortality as well as morbidity throughout the world[1,2]. Pre-eclampsia when complicated with generalized tonic-clonic convulsions and/or coma is called eclampsia[3]. Since eclampsia is a severe form of pre-eclampsia, early detection of risk factors, symptoms and signs by good antenatal checkup and initiation therapy will prevent occurrence of eclampsia. Unfortunately, eclampsia still complicates much larger number of pregnancies in the world. It is estimated that every year eclampsia is associated with about 50, 000 maternal death worldwide, most of which occur in developing countries[4]. The incidence of eclampsia has been reduced to. 2%-.5 % of all deliveries in developed countries. But in Bangladesh about 5% of the total pregnancies develop eclampsia[5]. There are approximately 3.6 million births per year in Bangladesh and over 10,000 women develop eclampsia each year[6]. It is one of the common cause of maternal mortality and responsible for 20% of maternal death[7]. Incidence of eclampsia varies inversely with the quality of antenatal care.

II. Methodology

This retrospective study was conducted on the diagnosed patients of eclampsia admitted in Enam medical college hospital, Savar, Dhaka, Bangladesh, during the period of January 2015 to December 2016. During these months total 2295 patients were admitted in obstetric ward and among them 35 patients were eclampsia. Age of patients, parity, type of eclampsia, gestational age, mode of delivery, maternal and fetal outcome were noted from medical records of patients. Patients with diagnosis of convulsion and coma of other causes were excluded.

All patients of eclampsia were followed up thoroughly from admission to discharge. Study was ethically approved by Ethical Review committee of Enam Medical College and Hospital. All data were entered in SPSS16 and also analyzed through it.

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III. Results

35 cases of eclampsia were recorded out of 2295 obstetric patients admitted during the study period which gives an incidence of 1.52%. 19(54.28%) cases were in between age of 21 to 30 years, while 12(34.28%) were less than 21 years and 4(11.42%) were more than 30 years as illustrated in Table 1.

Table 1: Age distribution of patients of eclampsia

Age	Frequency	Percentage
< 21 Years	12	34.28
21 to 30 years	19	54.28
> 30 years	4	11.42

Majority (60%) were nulliparous, while 40% were multiparous which is shown in Fig 1.

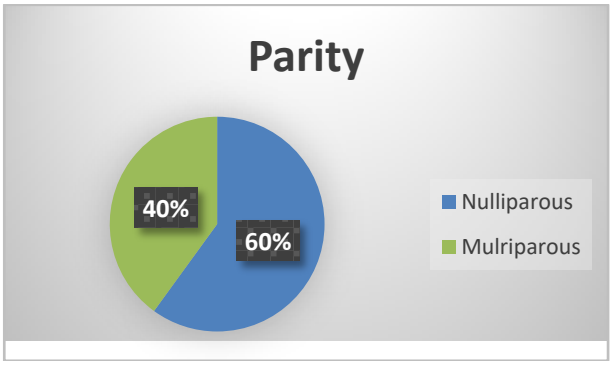

Fig. 1: Distribution of study patients according to parity

Most (62.85%) of the cases delivered preterm and 37.14% at term. Caesarean section were common mode of delivery being 24 (68.57%) cases, whereas delivered by vaginally only 13 (37.14%) cases. 15 (42.85%) had convulsion before delivery and 20 (57.14%) thereafter as illustrated in Fig 2, 3 and 4.

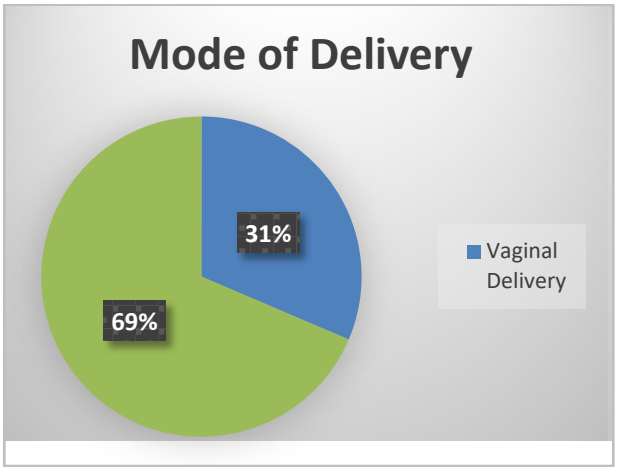

Fig. 2: Distribution of study group according to mode of delivery

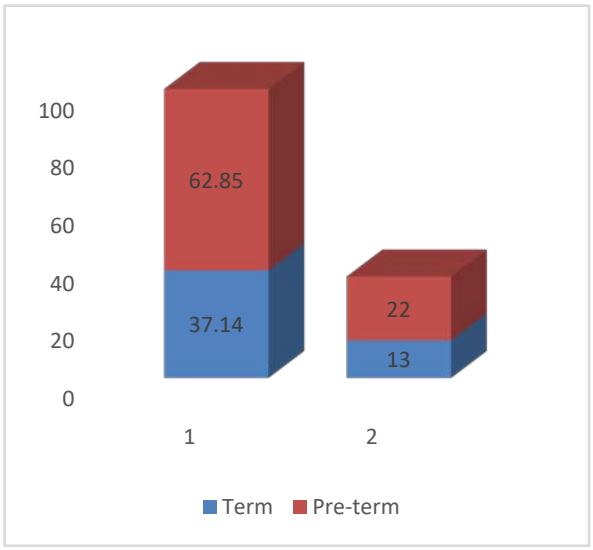

Fig. 3: Distribution of study group according to duration of pregnancy

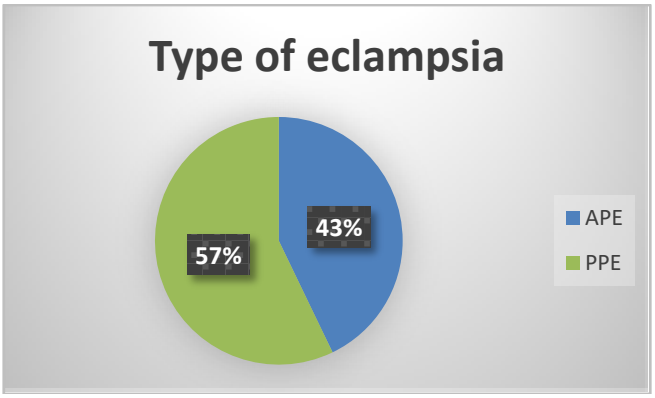

Fig. 4: Distribution of study population according to type of eclampsia

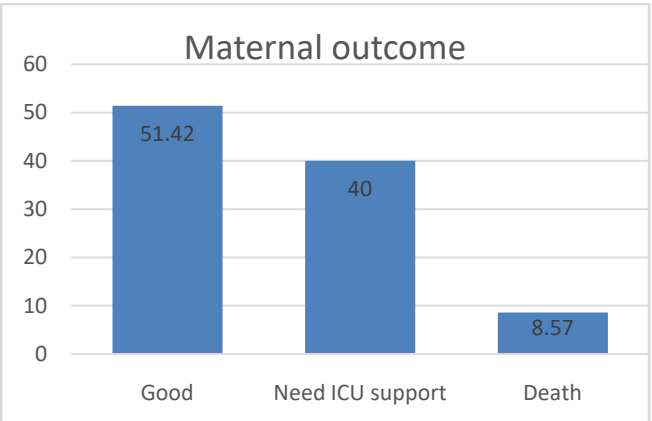

Fig. 5: Distribution of study group according to maternal outcome

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Table 2: Distribution of study subjects according to fetal outcome

Fetal Outcome	Frequency	Percentage
Term Healthy	6	17.14
IUGR	9	25.71
Preterm LBW	13	37.14
Perinatal Death	7	20

After meticulous treatment 18(51.42%) patients improved in eclampsia ward, while 14 (40%) patients needed ICU support and 3(8.57%) died. Among the babies only 6(17.14%) were term and healthy. Most (37.14%) of the babies were preterm low birth weight, 9 (25.71%) were IUGR and 7 (20%) were perinatal death which is shown in Fig 5 and Table 2.

IV. Discussion

The incidence of eclampsia in our hospital was 1.52% of total obstetric admission.. Onuh in Benin Nigeria reported 1.32% and Okafor recently reported an incidence of 0.82% in Abujia, Nigeria[8]. A high incidence of eclampsia is common in developing countries where most patients have no antenatal care which would allow for early recognition and treatment of eclampsia. Majority of the patients were between age 21 to 30 years in this study which is contrary to the report in the developed world where severe preeclampsia with severe features and eclampsia is significantly commoner among women older than 40 years[9]. Nulliparity strongly associated with eclampsia in this study is supported by previous reports in other centres[10-12].

Antepartum eclampsia accounted for 42.85% in this study is higher than 36.8% reported in Lagos but lower than 61.6%,84% and 85% reported in Ethiopia, Enugu and Ibadan respectively[11,13-15]. In our study post partum eclampsia was more common, about 57.14% which correlate with another study on similar topic[16].

The majority of antepartum cases in our study had eclampsia before term and caesarean section was a leading mode of delivery, which is comparable to other studies[17,18]. In this study patients underwent caesarean section due to an unfavourable cervix remote from delivery, but the decision to perform a caesarean delivery was based on multiple factors which included gestational age, foetal condition, stage of labour and Bishop scoring of cervix[19].

Maternal mortality rate of 8.57% reported in this study was higher than 7.9%, 8% and 9% reported respectively from Tanzania, India and Ibadan, Nigeria[14,20,21].

Hypertensive disorders are a common cause of preterm labour, perinatal death and intrauterine growth restriction[22]. The 20% perinatal mortality rate in this study is higher than 10% reported from Ibadan, but lower than 29% and 40.9% reported from Ethiopia and Kaduna, Nigeria respevtively[23,14,24]. A significant percentage (37.14%) of low birth weight neonates might have been the result of the high number of preterm deliveries among the eclamptic patients. Similar findings have been reported in the literature that links the incidence of low birth weight infants with preterm deliveries in eclamptic patients[17,25,26].

V. Conclusion

The incidence of eclampsia remains high in our hospital. Fetomaternal morbidity and mortality are in alarming rate. Hence, eclampsia remains a continuing problem in developing countries and leading cause of fetal-maternal mortality and morbidity. Careful antenatal supervision, early detection and management of high risk cases can reduce this dreadful disease.

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Successful Outcome of Pregnancy after Cystectomy for Twisted Ovarian Cyst : A Case Report

By Dr. Amrita Jain & Dr. Rekha Daver
Grant Government Medical College

Abstract- *Aim & Background:* Though ovarian masses during pregnancy are relatively common, its complication can pose a significant risk to pregnant woman and her fetus.

Two most common complications of ovarian mass are torsion and hemorrhage. Ovarian torsion encountered during pregnancy carries a significant risk to pregnant woman and intrauterine foetus. We present an interesting case of complication of an ovarian cyst in 2nd trimester of pregnancy and how it was managed with a successful antenatal outcome.

Case Description: In this case we report a 28 -year-old second gravida with 26 weeks of pregnancy presenting with torsion of the right ovarian cyst. She presented to the emergency with acute pain in abdomen and vomitting. She was diagnosed to have torsion of ovarian cyst with 26 wks live pregnancy. Emergency exploratory laparotomy followed by right ovarian cystectomy was done. Histopathology report showed a haemorrhagic ovarian cyst. Her pregnancy was followed up and was uneventful.

Keywords: *ovarian cyst torsion, pregnancy, corpus luteum cyst.*

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Successful Outcome of Pregnancy after Cystectomy for Twisted Ovarian Cyst : A Case Report

Dr. Amrita Jain [α] & Dr. Rekha Daver [σ]

Abstract- Aim & Background: Though ovarian masses during pregnancy are relatively common, its complication can pose a significant risk to pregnant woman and her fetus.

Two most common complications of ovarian mass are torsion and hemorrhage. Ovarian torsion encountered during pregnancy carries a significant risk to pregnant woman and intrauterine foetus. We present an interesting case of complication of an ovarian cyst in 2nd trimester of pregnancy and how it was managed with a successful antenatal outcome.

Case Description: In this case we report a 28 -year-old second gravida with 26 weeks of pregnancy presenting with torsion of the right ovarian cyst. She presented to the emergency with acute pain in abdomen and vomitting. She was diagnosed to have torsion of ovarian cyst with 26 wks live pregnancy. Emergency exploratory laparotomy followed by right ovarian cystectomy was done. Histopathology report showed a haemorrhagic ovarian cyst. Her pregnancy was followed up and was uneventful.

Conclusion: Ovarian torsion in second trimester of pregnancy, though is an extremely rare problem in pregnancy, adnexal torsion should be taken into consideration in the differential diagnosis of acute abdominal pain and urgent Ultrasound aids in diagnosis.

Keywords: ovarian cyst torsion, pregnancy, corpus luteum cyst.

Case Report

I. Background

The incidence of adnexal masses in pregnancy ranges from 1 in 81 to 1 in 8000 pregnancies[1]. The most frequent types of ovarian masses in pregnancy are corpus luteum cysts, endometriomas, benign cystadenomas, and mature cystic teratomas called dermoids. Because pregnant women are usually young, malignant tumors and those of low malignant potential are proportionately uncommon and vary from 4 to 13 percent[2].

Most ovarian masses are asymptomatic in pregnant women. Some cause pressure or chronic pain however acute abdominal pain may be due to torsion, rupture, or hemorrhage. Torsion of ovary is the total or partial rotation of the adnexa around its vascular axis or pedicle. Minimal or early twisting may compromise only venous flow, thus leaving arterial supply intact. Complete torsion causes total blockade of venous and lymphatic supply that leads to venous congestion, haemorrhage and necrosis, subsequently cyst becomes tense and may rupture.

The risk of ovarian torsion rises by 5 fold during pregnancy. Incidence is 5 per 10,000 pregnancies[3,4]. Torsion of ovarian tumors occurs predominantly in the reproductive age group. The majority of the cases presented in pregnant (22.7%) than in non-pregnant (6.1%) women[5].

Patient usually presents with acute pain in lower abdomen that frequently is accompanied by nausea and vomiting. Pelvic examination may reveal a tender cystic mass separate from the uterus.

Sonography aids in diagnosis and with Color Doppler, presence of ovarian mass with absent flow strongly correlates with torsion. Here, we report a case of torsion of ovarian cyst during second trimester of pregnancy with no known predisposing factors.

II. Case Description

A 28 year old second gravida who delivered her first child vaginally 2 years back presented in the emergency on 26/8/2016 with history of 6 months pregnancy with dull aching pain since 1 month & acute pain in abdomen and vomiting for one day. Pt gave history of abdominal pain since 1 month for which pt had shown in private where she was started on tocolytic agents.

Now she had acute pain since morning associated with nausea. On examination she was afebrile with pulse of 100/min and BP-120/80 mm Hg.

On examination her fundal height was corresponding to 26 weeks of gestation with Fetal heart sounds 150/m. Per abdomen tenderness was present in right iliac fossa region. There was no guarding/rigidity. Pelvic examination revealed cervical motion tenderness and right adnexal fullness.

Urgent USG done showed a single viable fetus of 26 weeks maturity and a septated cyst (10.6 ×8.4) cm in right lumbar region extending upto umbilicus probably originating from right ovary with absent flow. All other investigation reports were within normal limit. Patient was counselled about the risk of preterm labor

Author α: Asst Prof, Grant Government Medical College, Mumbai.
e-mail: amritadby1901@gmail.com
Author σ: (Prof & HOD).

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and informed consent for exploratory laparotomy with possible need for salphingoophorectomy taken.

During laparotomy (10 ×8) cm black gangrenous cyst was found in the right adnexa which was twisted around its pedicle 3 times (Figure 1 & 2). Right fallopian tube was found gangrenous, attached to the cyst. No free intraperitoneal fluid was found. Uterus was 26-28 weeks in size. Left sided fallopian tube and ovary were healthy. Right salphingoophorectomy was done without untwisting its pedicle.

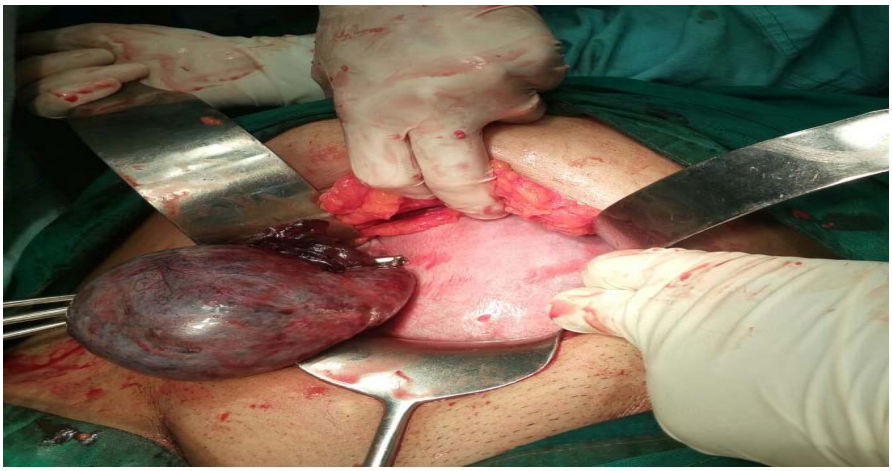

Figure 1: Twisted rt ovarian cyst with 26 wks pregnant uterus.

Figure 2: Specimen of 10 x 8 cm twisted rt ovarian cyst.

Post op she was started on injection Duvadilan. Her post operative period was uneventful and she was discharged on 7th postoperative day.

Histopathological examination of the specimen showed haemorrhagic ovarian cyst.

She was followed up in the antenatal clinic where rest of her antenatal period was essentially uneventful. Her follow up USG scans showed normal growth and development of the fetus.

On 11/12 2016, she was admitted at 40 wks in prelabour and she delivered vaginally 2.9 kg male baby.

III. Discussion

The management of ovarian tumors during pregnancy can be challenging because of the risk of fetal wastage and the possibility of surgery-related complications, or a delayed diagnosis of a possibly lethal disease or malignancy. Ovarian masses should be managed conservatively, because the majority of ovarian tumors in pregnant women spontaneously disappear during follow up[6].

Most ovarian masses are detected during routine prenatal sonography or during imaging done for other indications. The typical sonographic appearance of these masses are as - A simple anechoic cyst with smooth wall is characteristic of a physiological corpus luteum cyst or benign cystadenoma, Cystic structure with diffuse internal low level echoes suggestive of an endometrioma or hemorrhagic corpus luteum cyst. In some instance MR imaging can be used to evaluate complicated anatomy[2]. CA 125 levels are frequently elevated with ovarian malignancy.

If a cystic benign appearing mass is <5cm, it often requires no additional antepartum surveillance. Tumor between 5 and 10 cm should be carefully evaluated by sonography along with color Doppler and possibly MR imaging. For cyst >10cm, because of substantial risk of malignancy, torsion or labor obstruction surgical removal is reasonable.

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Complications of the ovarian cysts in pregnancy are torsion of the cyst, rupture, infection, malignancy, impaction of cyst in pelvis causing retention of urine, malpresentation of foetus and during labour obstructed labour[6]. Early diagnosis is essential as it makes a conservative approach possible. When diagnosis is made earlier, simple detorsion is possible with good functional results.

The diagnosis of twisted ovarian cyst, which is an acute abdominal emergency, can be made in the majority of cases, although the symptoms are nonspecific for ovarian torsion. The usual symptoms of torsion of an ovarian cyst are acute, colicky pain in the lower abdomen, with vomitting and tenderness. If torsion is suspected, laparoscopy or laparotomy is warranted. If the adnexa is healthy, there are two options. First, neoplasms are resected, ovarian cystectomy done if ischemic and oedematous ovary as it may be technically difficult, and adnexectomy may be necessary. Second unilateral or bilateral oophoropexy has been described to minimize the risk of repeated torsion[2].

Evacuation by needle aspiration is not recommended in pregnancy[7].

Differential diagnosis of ovarian cyst torsion in pregnancy includes: uterine leiomyomas, non preganant horn of bicornuate uterus, appendiceal abscess, diverticular abscess, pelvic kidney, retroperitoneal tumours, ectopic pregnancy and retroverted gravid uterus[5] .

IV. Conclusion

The management of ovarian cyst in pregnancy is usually conservative with serial ultrasound monitoring. The nature of an ovarian cyst should be studied in detail and malignancy has to be ruled out. Ovarian torsion in second trimester of pregnancy, though is an extremely rare problem in pregnancy, adnexal torsion should be taken into consideration in the differential diagnosis of abdominal pain. Treatment options are limited to surgery, either by laparoscopy or laparotomy. In our case we performed a laparotomy with Pfannenstiel incision, and did not attempt to untwist the adnexa because of widespread necrosis.

Clinical Significance

Most common cause of ovarian cyst in pregnancy is corpus luteum cyst which regresses by 12 to 16 weeks[8]. Ovarian torsion, therefore, occurs most frequently in the first trimester, occasionally in second, and rarely in third[8]. If the ovarian cyst is diagnosed in the first trimester, it is better to wait till 16 wks when the implantation of pregnancy is more secure and also the cyst may disappear spontaneously. Persisting tumours are treated by cystectomy or ovariotomy as indicated. Ovarian tumour or cyst can be easily removed till 28 wks of gestation thereafter not only it becomes hard to access but also operation may precipitate preterm labour.

Previously untwisting of the pedicle was avoided to prevent emboli and toxic substances related to hypoxia, from entering peripheral circulation, but recently, re-establishing ovarian circulation by untwisting, has shown to improve circulation in viable ovarian tissue with no systemic complications[3,4]. Obviously in cases where ovarian cysts have undergone gangrenous changes, untwisting are not tried, which was present in the present case. Thus each case has to be individualized, and the management should be done accordingly.

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Biochemical Markers and Uterine Artery Doppler Study for the Prediction and the Severity of the Hypertensive Disorders during Pregnancy

By Saptarshi Chakraborty, Veena Acharya & Surabhi Saharan

Mahatma Gandhi Medical College & Hospital

Abstract- Hypertensive disorder in pregnancy (HDP) is one of the major cause of maternal and perinatal mortality & morbidity worldwide particularly in developing countries. In developed countries, maternal mortality rate varies from 4-40 per 1 lakh live birth. In developing countries, it varies from 100-700 with India having 178 per 1 lakh live birth.

Objective: Study of biochemical markers and uterine artery Doppler for the prediction of hypertensive disorders and its severity. Sensitivity and Specificity of biochemical markers and Uterine Artery Doppler and their comparison for the prediction and the severity of hypertensive disorders during pregnancy.

Material & Methods: This is a prospective study. Approximately hundred patients with hypertensive disorders during pregnancy attending the OPD (Out patients Department) and IPD (In patient Department) in Obstetrics & Gynecology department will be included.

Keywords: hypertension, hypertensive disorder in pregnancy, biochemical markers, uterine artery doppler.

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Biochemical Markers and Uterine Artery Doppler Study for the Prediction and the Severity of the Hypertensive Disorders during Pregnancy

Saptarshi Chakraborty [α], Veena Acharya [σ] & Surabhi Saharan [ρ]

Abstract- Hypertensive disorder in pregnancy (HDP) is one of the major cause of maternal and perinatal mortality & morbidity worldwide particularly in developing countries. In developed countries, maternal mortality rate varies from 4-40 per 1 lakh live birth. In developing countries, it varies from 100-700 with India having 178 per 1 lakh live birth.

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All the patients in this study group will be subjected to biochemical markers tests and Ultrasonographic evaluation of the pregnancy along with the Arterial Doppler of both the Uterine Artery and Umbilical Artery will be done.

Conclusion: Using biochemical markers (Inhibin-A and PAPP-A) and Uterine Artery Doppler Study in combination is significantly useful in early prediction of PIH having specificity and sensitivity of Inhibin-A as 88.89% and 83.33%, PAPP-A as 89.29% and 71.43%, Uterine artery Doppler study – Pi Index as 91.67% and 85.71 %, Ri Index as 87.5% and 71.43% and diastolic notch as 94.44% and 92.85 % respectively. The use of biochemical markers and uterine artery Doppler Study as an important tool for early prediction of PIH and has a lot of prognostic value.

Keywords: hypertension, hypertensive disorder in pregnancy, biochemical markers, uterine artery doppler.

I. Introduction

Hypertensive disorders of pregnancy are one of the major cause of maternal and perinatal mortality and morbidity worldwide particularly in developing countries. Hypertensive disorder of pregnancy is a sign of an underlying pathology which may be pre existing or appear for the first time during pregnancy. The identification of this clinical problem & effective management plays a significant role in the prevention of the adverse effects on pregnancy outcome [1].

Author α σ ρ: Department of Obstetrics & Gynaecology, Mahatma Gandhi Medical College & Hospital, Sitapura, Jaipur, Rajasthan, India.
e-mail: saptarshichakraborty8@gmail.com

Hypertensive Disorders of Pregnancy is a multi-system disorder, which is characterized by new onset hypertension (systolic and diastolic blood pressure of≥ 140 and 90 mm Hg, respectively, on two occasions, at least 6 hours apart) and proteinuria (protein excretion of ≥ 300 mg in a 24 h urine collection, or a dipstick of ≥ 2+), that develop after 20 weeks of gestation in previously Normotensive women [2].

Hypertensive Disorders of Pregnancy can have an early onset (preeclampsia starting before 34 weeks of gestation) or late onset (preeclampsia starting after 34 weeks of gestation), can show mild or severe symptoms (systolic blood pressure ≥ 160 mmHg or diastolic blood pressure ≥ 110 mmHg, proteinuria >5 g/24 hours, oliguria, neurological symptoms, other clinical symptoms such as deranged liver function, thrombocytopenia < 100 000 mm3, HELLP syndrome), and can evolve in eclampsia in the most severe cases whereas Eclampsia is the occurrence of one or more convulsions superimposed on the syndrome of pre-eclampsia [3].

Dependent on the systemic involvement along with several other symptoms, such as edema, disturbance of hemostasis, renal or liver failure, and the HELLP syndrome (hemolysis, elevated liver enzymes, and low platelet counts) also complicates the clinical picture.

Most theories on the etiology of hypertensive disorders of pregnancy suggests that the disease is a cascade triggered by combination of abnormal maternal inflammatory response, endothelial cell activation/ damage with deranged hemodynamic milieu, and deranged immunity [4,5].

Numerous patho-physiological mechanisms, alone or in combination, have been suggested to be responsible for the diverse subsets of hypertensive disorders of pregnancy. They include impaired vascular remodeling of the maternal–fetal interface, excessive immune response to paternal antigens, systemic inflammatory response, and dysfunctional placental or endothelial response, all of these processes being modulated by genetic and environmental parameters. Such heterogenicity of potential processes leading to, or resulting from, hypertensive disorders of pregnancy has contributed to the lack of diagnostic means for identification of women susceptible to developing pre-

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eclampsia, resulting in delayed recognition and severe complications and impeding evaluation of new preventive interventions [6].

Since there is an involvement of various organ systems, the potential markers would include inhibin A, PAPP-A, Activin A, angiotensin 11 sensitivity, urine albumin excretion, uric acid and microproteinuria, urinary inhibin-a, urinary kallikrein –calcium/kallikrein ratio, maternal serum alpha fetoprotein; coagulation and platelet activation [7].

Risk factors for preeclampsia: Include nulliparity, multifetal gestations, previous history of preeclampsia, obesity, diabetes mellitus, vascular and connective tissue disorders like systemic lupus erythematosus and antiphospholipid antibodies, age >35 years at first pregnancy, smoking, and African American race. Ultrasonography Color Doppler study may also help in the prediction of hypertensive disorder. Persistence of high impedance to blood flow in the uterine arteries of women with hypertension, which is one of the indirect evidence of abnormal placentation also helps in early identification of disease[8].The changes are increased systolic to diastolic ratio, absent diastolic flow, reverse diastolic flow depending upon severity of the disease[9]. With the help of Uterine Artery Doppler Velocity waveform analysis we can measure resistance index, pulsatility index, systolic/diastolic ratio, diastolic/systolic ratio, presence of any diastolic notch [10].

The specificity and sensitivity of the Uterine Artery Color Doppler Study for Pi Index are 91.67% and 85.71%, Ri Index 87.5% and 71.43% and for Diastolic Notch are 94.44% and 92.86% which is very useful in early detection of PIH [11]. Therefore, Ultrasonography Color Doppler study may also help in the prediction of hypertensive disorder. Persistence of high impedance to blood flow in the uterine arteries of women with hypertension, which is one of the indirect evidence of abnormal placentation also helps in early identification of disease[12].The changes are increased systolic to diastolic ratio, absent diastolic flow, reverse diastolic flow depending upon severity of the disease[13,14].

WHO, UNFPA, UNICEF, IPPFF, the population council and other national & international agencies concerned with safe motherhood concluded that it is possible to reduce maternal mortality significantly with investigation and its effective management [15].

Reducing maternal mortality by 75% between 1990 and 2015 has been considered as part of the millennium development goals of the World Health Organization (WHO) Nations [15].

II. Materials and Methods

This is a prospective study done at Mahatma Gandhi Medical College & Hospital, Sitapura, Jaipur. Approximately 100 patients, during pregnancy attending the OPD and IPD in Obst. & Gynae department will be included. Patient's detailed clinical history, personal history, significant medical history, obstetric history and menstrual history will be taken.

General examination of all the patients will be done and Pulse, Blood Pressure, Temperature and Respiratory Rate will be noted.

Systemic examination including heart, lungs and other systems will be examined in detail.

All the patients in this study group will be subjected to all the routine blood tests and special tests, including biochemical markers. A detailed Ultra-sonographic evaluation of the pregnancy along with the Arterial Doppler of both the Uterine Artery and Umbilical Artery will be done. All patients will be kept in the regular follow up and in the end, their maternal and fetal outcome will also be noted.

Special blood tests will be including:

1) Complete blood count (specially hemoglobin and platelet count),
2) Liver function tests including SGOT, SGPT, Alkaline Phosphatase Level, LDL Level and PT/INR.
3) Lipid profile – LDL, HDL, Triglyceride, Total Cholesterol, VLDL.

Biochemical Markers: Serum Uric Acid, Blood Urea, Serum Creatinine, Activin-A, Pregnancy Associated Plasma Protein-A (PAPP-A)

Urinary Tests: Urinary Micro Albumin Level, Urine Protein/Creatinine Ratio, Urinary Calcium Creatinine Ratio.

In the Doppler study following parameters will be assessed:

Pulsatility Index: A measure of the variability of the blood velocity in a vessel equal to the difference between the peak systolic and minimum diastolic velocities divided by the mean velocity during the cardiac cycle.

Calculated by = Peak Systolic Velocity - End Diastolic Velocity/Mean Velocity

Resistance Index: Is a measure of pulsatile blood flow that reflects the resistance to blood flow caused by microvascular bed distal to the site of measurement.

Calculated by = Peak Systolic Velocity - End Diastolic Velocity/Peak Systolic Velocity

Systolic to Diastolic Ratio: Determinations of blood flow velocities that reflects intrinsic resistance in an arterial blood vessel.

Presence and absence of the diastolic in both the uterine arteries.

Using Statistical test i.e. Z-test where the distribution of the test statistic under the null hypothesis can be approximated by a normal distribution, using expected value θ of T under the null hypothesis, and then obtaining an estimate S of the standard deviation of

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T, the standard score Z = (T– θ) / s is calculated, will be applied wherever needed.

With the help of these statistical methods, the sensitivity and the specificity of the biological markers and the Uterine Artery Doppler study will be calculated.

III. Results

Pregnancy Induced Hypertension is the most common obstetrical disorder world-wide and on a national scale in India also. It is one of the major causes of maternal and fetal mortality.

Table 1: Distribution of the cases according to Age

Age in Years	No. of patients	Percentage
20 -24	48	48%
25 – 29	27	27%
29- 33	17	17%
34 – 38	7	7%
39 – 40	1	1%
Total	100	100%

Table 1 showed the age distribution of 100 patients of my study group that maximum patients 38% were in the age of 20 – 24 years and second most common were in the age group in between 25 – 29 years that was 27%. While only 8 patients were above 35 years.

Table 2: Distribution of the cases according to Parity

Parity	No. of patients	Percentage
Para 1	22	81 %
Para 2	32	12 %
Para 3	20	3%
Para 4	18	2%
Para 5	7	2%
Total	100	100%

In this present study of 100 patients, maximum number of patients was primigravida (81%), while multiparous women were 19%.

Table 3: Distribution of the cases according to occupation

Wife Occupation	Number	Percentage
Farmer	6	6
Housewife	84	84
Labour	1	1
Nurse	3	3
Self Employed	1	1
Sweeper	1	1
Teacher	4	4

Out of 100 patients, maximum number of patients 84% was from house wife while 16 had their own jobs (4 were teacher, 3 had nursing job, 6 were working in the field etc.)

Table 4: Distribution of the cases according to Residence

Location	Number	Percentage
Rural	56	56
Urban	44	44
Total	100	100

Out of 100 patients, 56 patients were residing in rural area while 44% in urban area.

Table 5: Distribution of the cases according to Socioeconomic Status (Kuppuswami Scale)

SE. Status	Number	Percentage
Lower Class	65	65
Middle Class	31	31
Upper Class	4	4
Total	100	100

In this study of 100 patients, 65 patients were from lower socioeconomic group, while only 4 patients belong to upper class and 34 were from middle class.

Distribution according to age group: In my study, 55% were present between 20- 35 years, 7% 34 – 38yrs and 1% 39 – 40yrs.

Same age groups were studied by MANJUSHA SAJITH, VANDANA NIMBARGI et. al. in their study had 1330 patients, out of which 104 were between the age group of 18-32 years.

Distribution according to Parity: In my study on the basis of parity showed that maximum number of patients were from the Primigravidae group comprising about 81% of the total patients.

Mary Esien Kooffreh, Mabel Ekott, Dorcas O Ekpoudom in their study on the prevalence of pre-eclampsia among pregnant women including 8524, showed that majority of the patients between the age group of 25-29 years that is about 104 patients were Primigravida.

Distribution according to Occupation: In my study out of 100 patients 84% were housewives and 16% were working women.

Swati Singh, Ekele Bissallah Ahmed, Shehu Constance Egondu and Nwobodo Emmanuel Ikechukwu in their study on Hypertensive disorders in pregnancy among pregnant women showed that maximum number of patients that is 88.13% were housewives.

Distribution according to Residence: In my study maximum numbers of patients were from rural area i.e.56%.

Shikha Saxena, Prem Chandra Srivastava, K. V. Thimmaraju et. al in their study on Socio-demographic Profile of Pregnancy Induced Hypertension in a Tertiary

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Care Centre showed that maximum number of patients that is 77.14% were residing in rural area.

Distribution of the cases according to Socioeconomic Status: In my study maximum number of patients i.e. 65% were from lower socioeconomic status.

Parveen M. Aabidha, Anne G. Cherian, Emmanuel Paul and Jasmin Helan in their study on Maternal and fetal outcome in pre-eclampsia in a secondary care hospital in South India showed that maximum number of patients 61% were from lower socioecono

Uterine Artery Doppler Study specificity and sensitivity in the prediction of PIH

It showed that Doppler Study of Uterine Artery depicting 100 patients. In this table out of 100 patients, Pi Index was normal in 66 patients and elevated in 6 patients, out of 72 normotensive patients, whereas in Ri Index 63 patients were normal and 6 elevated, out of 72 normotensive patients and in diastolic notch 68 patients were having absent notch and 4 patients had notch present out of 72 patients who were normotensive on follow-up. Whereas in case of 28 PIH patients, Pi Index was elevated in 24 patients and 4 patients were in normal value, whereas in Ri Index 20 patients were having elevated Ri Index and 8 patients were having normal value and in diastolic notch 26 patients had present notch and 2 had absent. This table showed the specificity and sensitivity of Pi Index, Ri Index and Diastolic Notch as 91.67%, 87.5% and 94.44% and 85.71%, 71.43% and 92.86% respectively along with Pi Index PPV 80%, NPV 94.29% and accuracy of 90%, whereas Ri Index PPV 68.97%, NPV 88.73% and accuracy of 83% and diastolic notch PPV 86.67%, NPV 97.14% and accuracy 94% showing Pi Index is having higher specificity and sensitivity along with other parameters after diastolic notch.

IV. Conclusion

I from my study infer that using biochemical markers (Inhibin-A and PAPP-A) and Uterine Artery Doppler Study in combination is significantly useful in early prediction of PIH having specificity and sensitivity of Inhibin-A as 88.89% and 83.33%, PAPP-A as 89.29% and 71.43%, Uterine artery Doppler study – Pi Index as 91.67% and 85.71 %, Ri Index as 87.5% and 71.43% and diastolic notch as 94.44% and 92.85 % respectively.

V. Discussion

My Study on Early prediction of Hypertensive Disorders of Pregnancy using biochemical markers and uterine artery Doppler study was conducted on 100 pregnant women attending the antenatal clinic of Mahatma Gandhi Medical College, Jaipur. Out of 100 patients, 72 patients were normotensive and 28 patients were of PIH.

In my study group maximum patients were in the age group of 20-29 years comprising 75% and second most common were in the age group in between 29 – 33 years that was 17%, While only 8 patients were above 35 years with mean age 26.7 years.

Maximum number of patients were primigravida (81%), while multiparous women were 19%. Maximum number of patients was housewives 84%, while 16 had their own jobs. 56% patients were from rural area while 44% in urban area. 65% patients were from lower socioeconomic group, while only 4 patients belonged to upper class and 34 were from middle class.

9% patients were between 16-20 weeks, 26% between 20-24 weeks and 65% patients were between 25-29 weeks.

77% showed normal range of blood urea 20-24mg/dl, while 23% showed slightly high level of urea, while 93% patients had slightly raised serum bilirubin, while serum creatinine were normal in all the patients.

Out of 72 normotensive patients, 64 patients had normal level of Inhibin-A 514-890 pg/ml, while 8 patients had elevated level of Inhibin-A (891-1021 pg/ml) and out of 28 PIH patients, 3 patients had an Inhibin-A level within normal range and 25 patients had elevated Inhibin-A level showing the specificity and sensitivity of Inhibin-A as 88.89%, 83.33%, PPV 75.76%, NPV 95.52% and accuracy of 89%.

Out of 72 normotensive patients, 60 patients showed normal level of PAPP-A 0.90-0.60, while 12 patients had decreased level of PAPP-A (0.50-0.40) and out of 28 PIH patients, 8 patients had normal PAPP-A level and 20 patients had decreased PAPP-A level showing the specificity and sensitivity of Inhibin-A as 89.29% and 71.43%, PAPP-A PPV 62.5%, NPV 88.24% and accuracy of 80%.

12. Out of 72 normotensive patients, 66 patients had normal Pi Index while 6 patients had slightly elevated level. Out of 28 PIH patients 24 patients had elevated Pi Index and 4 had normal Pi Index. This result showed the specificity and sensitivity of Pi Index as 91.67% and 85.71 % and having a PPV of 80%, NPV of 94.29% and accuracy of 90%.

Out of 72 patients who remained normotensive, 63 patients had normal Ri Index, while 9 had slight elevated level and out of 28 patients who developed PIH on follow-up, 20 patients showed elevated level of Ri Index, while 8 patients had normal Ri Index, showing the specificity and sensitivity of Ri Index are respectively 87.5% and 71.43%, which is followed by 68.87% of PPV, 88.73% of NPV and accuracy of 83%.

Out of 72 normotensive patients, 57 patients had absent diastolic notch, while 15 patients had diastolic notch present and Out of 28 patients who developed PIH on follow-up, 21 patients had diastolic notch present, while 7 patients had absent diastolic notch showing the specificity and sensitivity of 94.44%

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and 92.85 % respectively while PPV was 94.44%, NPV 86.67% and accuracy of 94%.

VI. Acknowledgements

I would like to acknowledge:

Abbreviations:

HDP –Hypertensive Disorder in Pregnancy,
OPD – Out Patient Department,
IPD – In Patient Department,
PAPP-A – Pregnancy Associated Plasma Protein-A.

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Awareness of Signs of Obstetric Complications amongst Married Couples: Implications for Decision-Making towards Care-Seeking. A Qualitative Study of Selected Districts in Ghana

By Bougangue Bassoumah & Mpawenimana Abdallah Saidi
Universitiy Malaysia Sarawak

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Keywords: *awareness, maternity, signs, intra-household, decision-making, clinic attendance, needs assessment.*

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Awareness of Signs of Obstetric Complications amongst Married Couples: Implications for Decision-Making towards Care-Seeking. A Qualitative Study of Selected Districts in Ghana

Bougangue Bassoumah [α] & Mpawenimana Abdallah Saidi [σ]

Abstract- This paper examined how couples' awareness of signs of obstetric complications inform intra-household decision-making towards care-seeking. The data were generated from twelve focus groups and twenty-four individual interviews involving women who were receiving maternity care and their husbands in the Yendi Municipality, Awutu-Senya West and Chereponi Districts in Ghana. Quota sampling and snowballing were used to reach the participants. The study classified couples as knowledgeable or less knowledgeable based on their level of awareness of key signs of obstetric complications. Most knowledgeable couples took joint decisions devoid of cultural and gender influences. Their decisions were reached based on their knowledge about signs/symptoms of obstetric complications and their implications for maternal and neonatal health. There were some level of gender equality and female autonomy amongst the knowledgeable in decision-making. However, decisions made by less knowledgeable couples were male-dominated, culture- and gender-driven embedded in health beliefs and traditional gender norms. Decision-making by the less knowledgeable was associated with delays due to socio-cultural structures within the household and community. Though decisions by knowledgeable couples showed positive attitudes towards care-seeking as compared with the less knowledgeable, the data indicated that awareness of maternity conditions did not necessarily translate into positive clinic attendance because it may be influenced by cultural beliefs and gender roles to determine the need for clinical care as well as the type of care-seeking decision taken by couples. Healthcare practitioners should consider carrying out need-assessment for maternal counselling messaging for couples. Education on pregnancy and related complications as well as their implications for maternal and neonatal health is essential to facilitate informed decisions and prompt maternal clinic attendance for positive health outcomes.

Keywords: awareness, maternity, signs, intra-household, decision-making, clinic attendance, needs assessment.

I. Background

Studies on maternity have shown that intra-household decision-making is an essential component of maternal healthcare service utilisation (Tsikata, 2007; Babalola & Fatusi, 2009; Hagman, 2013; Ghana Statistical Service [GSS], 2008, 2009, 2015; International Centre for Research on Women [ICRW], 2008, 2010; Bougangue, 2017). Informed decision is a necessary requirement to ensure appropriate timing and choice of source of healthcare. However, reaching an informed decision depends on the couple or the care-giver's awareness of signs of obstetric complications as well as their health implications (GSS, 2008; ICRW, 2010). This is because awareness of signs and complications arising from pregnancy and childbirth facilitates early recognition of danger signs/symptoms associated with maternity, which forms the basis of care-seeking decision-making (Waiswa et al., 2010; Comb Thorsen et al., 2012). This requires active involvement of women, for appropriate clinical diagnosis is largely dependent on the information that is given to professionals by the women or their care-givers (WHO, 2002, 2003).

Research has established that, apart from bleeding, most obstetric conditions cannot easily be recognised by non-professionals until the situation aggravates, whilst some other complications occur suddenly at the onset and quickly progress to become life-threatening (WHO, 2003; GSS, 2015). Based on this, the WHO enjoins all member countries to educate women on maternity issues with the view to increasing their knowledge and understanding of pregnancy and childbirth as a pre-condition for adequate preparation and sound decision-making towards pre-natal, intra-partum and post-partum care (WHO, 2002; 2013). Some couples may be aware of key danger signs of obstetric conditions but lack of knowledge and understanding of the implications of these signs for pregnancy outcomes could influence their care-seeking decisions. Sometimes, early signs and symptoms may be ignored by the pregnant woman or her spouse because the signs may be considered as 'normal' (WHO, 2001; Senah, 2003; Okolocha et al., 1998 in WHO, 2003 pg.45).

Female autonomy and joint decision-making are recommended for couples to ensure informed decisions for positive maternal and child health outcomes (ICRW, 2008, 2010; UNFPA/ICRW, 2014). However, this usually

Author α σ: (PhD), Faculty of Social Sciences, Universitiy Malaysia Sarawak, Malaysia. e-mails: wepyjadam@gmail.com, mpawenimanaas@gmail.com

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becomes impossible, particularly in patriarchal societies where decision-making is considered as a men's space (Nwokocha, 2007; Bougangue, 2017). This act of gender discrimination, which creates inequality in decision-making is more entrenched in rural communities and amongst people who are not well informed about maternity and its associated complications (Bougangue & Ling, 2017). It is women who carry pregnancy and experience the symptoms of its complications, and, therefore, they, in particular, can best determine the severity of the conditions and the need for healthcare. However, most women are marginalised at the household level in decision-making towards maternity care-seeking (Hagman, 2013; Bougangue, 2017). In some patriarchal communities in Ghana, decision-making is regarded as an act of protection for women, with spirituality attached as a restriction to the females (Bougangue, 2017). This situation compromises quality decision and positive maternal healthcare behaviour towards care-seeking, with an implication for health outcome.

Though some men may engage their spouses in intra-household decision-making, the final decision on care-seeking is usually reached based on the man's own assessment of the severity of the woman's condition and the need for care (Ampim, 2013; Bougangue, 2017). Meanwhile, studies show that some men are not aware of maternity signs and complications, which suggests that men may lack the knowledge to make informed decisions for their spouses. This presupposes that male-dominated decisions are most likely to have far-reaching implications for maternal and neonatal healthcare. Thus, active involvement of women in intra-household decision-making is a crucial strategy for positive maternal outcomes (ICRW, 2008, 2010). Moreover, female autonomy at the household level facilitates quicker decision-making and promotes positive behaviour towards maternity care-seeking, which is a necessary pre-condition for improved maternal and neonatal health (Babalola & Fatusi, 2009; Hagman, 2013).

This paper assessed how couples' awareness of maternity signs and complications influences female spousal involvement in intra-household decision-making towards maternity care-seeking vis-a-vis clinic attendance. The paper provides insight into how healthcare decision-making affects women's health during the pregnancy-postpartum period. This study is motivated by the fact that gender inequality and women's low social status and disempowerment, relative to men, significantly impact women's healthcare decisions, their health and the demand for maternal healthcare services (African Union, 2006; Nwokocha, 2007: Bougangue & Ling, 2017).

II. Methodology

a) Study setting

The Awutu-Senya West and the Chereponi Districts are newly created districts in the Central and Northern Regions of Ghana, with Awutu-Beraku and Chereponi as the administrative capitals respectively. The Yendi Municipality is located in the Northern Region, with Yendi, the paramouncy of Dagban Traditional Area as the capital town. Both the Yendi Municipality and the Chereponi District are Muslim-dominated settings, whilst the Awutu-Senya West District is dominated by Christians. The Dagombas, from the Mole-Dagbani ethnic group, form the largest proportion in the Yendi Municipality whilst the Awutus and the Chokosis, from the Guan and Akan ethnic groups, are the main ethnic groups in the Awutu-Senya and Chereponi districts respectively (Awutu-Senya West District Assembly, 2015; Yendi Municipal Assembly, 2015; Chereponi District Assembly, 2015). Most of the households in Yendi Municipality and the Chereponi District are headed by men. The compound house system forms the predominant housing system in these areas, where couples live together with members of the extended family, usually relatives of the husbands (Chereponi District Assembly, 2015; Yendi Municipal Assembly, 2015).

b) Research design

The study adopted a qualitative design, using culturally appropriate methods in the data collection and analysis. This design was adopted to provide space for married couples to share their experiences/knowledge about signs of pregnancy/labour-related complications through focus group and individual interviews. The questions used in this study to assess the awareness of couples of the complications related to pregnancy and childbirth were adapted from the 2008 Ghana Demographic and Health Survey and the 2007 Ghana Maternal Health Survey. Spouses were made to identify pregnancy-related signs/symptoms, complications and their implications individually. Couples who exhibited high level of awareness were categorised as *knowledgeable* whilst those with low level of awareness were classified as *less knowledgeable*. The research organised separate focus group interviews for the two categories of couples. Also, some of the spouses from both the knowledgeable and less knowledgeable categories of couples were individually interviewed.

c) Sampling and data collection

The data were solely collected by the lead author who was the principal researcher in this study. Women who were receiving maternity care between August 2015 to December 2015 and their spouses were purposively selected for the study and reached through quota sampling and snowballing. Based on thematic data saturation, twelve FGDs and twenty-four IDIs were

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conducted in the three settings. The districts were put into urban and rural zones. Two FGDs and four IDIs involving *knowledgeable* and *less knowledgeable* couples were conducted in each zone in each district. The use of the IDI was to validate the FGD data by providing privacy to participants to some extent for them to express themselves freely and candidly (Milena et al., 2008). This allowed the research to delve deep into very subtle issues that could not have been possible with the FGD. In each setting and zone, the knowledgeable were separated from *less knowledgeable* for the FGDs.

d) Ethical consideration

Following the Ghanaian custom and research ethics, permission was sought from the chiefs and assembly members of the sampled communities, family heads, as well as the participants before data collection. The purpose and importance of the research outcome were explained to both the community leaders and participants. In addition, each participant was given consent form to sign or thumb-print, and was assured of anonymity and confidentiality before the interview sessions. The participants' consent was also sought for publication of the outcome of the study in both electronic and print format.

e) Data analysis

For analysis, expansion of field notes and transcription of recorded data were done within 24 hours. This guided subsequent data collection where the initial analysis suggested change of questioning, and the participants were easily contacted for clarity in cases where important information was missing. To ensure trustworthiness and dependability, the research employed strategies such as combining FGD with IDI, reflexivity during the preparation of the research design and questions, the data collection process and in the various stages of analysis. Also, iterative questioning was employed to ensure that deliberate lies were uncovered during the interactions.

Inductive thematic analysis was the major framework for analysing the data. The data were recorded with a tape recorder during the FGDs and IDIs sessions. Inter-coder analysis was employed, using the results of NVIVO software application and manual coding system. Final coding was done by judging the outcomes of the two techniques. Similar thoughts experienced across the participants were identified, coded and grouped. Out of each group of similar thoughts, a unifying concept or underlying theme was derived. Key points, phrases, and illustrations were also identified to back up the findings, whilst similar emerging themes were grouped together to form major themes.

III. Results

a) Awareness of Signs/Symptoms of Obstetric Complications

i. *The Knowledgeable*

Couples who were aware of maternity and its related complications were able to identify critical periods in pregnancy and complications, such as bleeding, severe waist pain/abdominal pain, persistent severe vomiting (hyperemesis gravidarum) leading to weight loss and dehydration, severe morning sickness and general body weakness, with a few of them mentioning symptoms of pre-eclampsia such as blur vision, frequent headaches and fatigue. In a response to a question on signs of pregnancy, a 28-year old SHS graduate pregnant woman in her first pregnancy in an urban community explained this in IDI:

> "*I think nausea, enlargement of breast and the tommy, vomiting and feeling sleeping always are all signs but the seriousness of a particular sign depends on the individual. Mine started with sleeping and I did not realise until I missed my menses before I went to hospital and they told me I was pregnant. I don't vomit and I eat any food without problem but I know some women find it difficult to eat especially, in their first three months in pregnancy.*"

The husband had this to say about critical period in IDI:

> "*To me, I will say the first 3 months is normally a month women and their spouses need to be very careful. They say the baby is very delicate at this stage. So, any small thing can terminate the pregnancy or affect the baby in the womb. I also realised that women who normally die from pregnancy and childbirth experience this misfortune either at delivery point or immediately after delivery. So, all these periods are very critical for the woman and the foetus' survival.*" (34 years, diploma)

These participants explained that the first trimester is critical since the foetus is very delicate, as it undergoes formation within the womb and can be aborted or malformed if not properly taken care of. They mentioned that miscarriages normally occur within this period or within few days after this period. This statement made by a man in IDI was common in the IDIs and FGDs involving the knowledgeable couples:

> "*Normally, before miscarriage some blood will come out of the woman's vagina. In the early part of pregnancy or before 4 months in pregnancy the baby is like blood. So, if something happens, it will come out like blood. Therefore, if the woman doesn't go to see doctor she may lose her unborn baby. She needs to go and check the pregnancy so that they give her treatment. They say until the baby is fully grown any blood from vagina can lead to termination*

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of pregnancy. So, they told us to go to see doctor when we feel strong abdominal pains or we see blood." (Husband, 42 years, JSS).

On signs of labour, below were responses from a husband and a wife in separate interviews:

"*When I am getting ready for delivery, I see that water comes from my vagina. I can see that some dirty thing like blood also comes from the vagina. I feel like going to urinate or going to toilet. I get back pains in pregnant but when it is getting to time to born the back pain is seriously.*" (Wife, 40 years, JSS graduate).

"*From my experience in my wife's previous pregnancies, normally some water comes out of her organ. Sometimes too she becomes restless with frequent urination or visiting toilet. When I see that then I know she is about to deliver. Another thing is that there is this dirty fluid from the sex organ thicker than water but not clean.*" (Husband 46 years, SSS graduate).

The conditions associated with labour, such as labour dystocia, prolonged labour and retention of the placenta were also mentioned by these participants. However, the causes of these conditions were received with mixed ideas inclined to women's physiology and spiritualism. They were also well-informed about postpartum haemorrhage, as well as puerperal and neonatal infections. Others who knew about the physiological causes also added that there is a spiritual aspect to retention of baby/placenta during delivery. Whilst agreeing with their colleagues, some participants also held these views expressed by their colleague in FGD:

"*I agree with Agi but sometimes it is not a doctor's issue because some bad spirits can attack the women and make them suffer. They may even die. Even the spirits can hold the placenta so that the woman or the baby will die. Some are as a result of curses from fathers, mothers or ancestors of either of the spouses which requires rituals for solution.*" (36 years, 2 children, primary school, urban community).

They were also well-informed about postpartum haemorrhage and infections associated with delivery, and they also had adequate knowledge about the need for clinic attendance to stop bleeding or screen both the mother and baby early after birth for infections. For instance, in IDI one woman noted:

"*Bleeding after childbirth has killed many women. It is not about the birth cert or for weighing alone that we should attend PNC early as some of the women think. You or your baby may be infected but you or the people around you may not detect except clinical test. I was told by the midwife that after delivery it is important to be screened for and treated of any infections that might affect the mother or baby.*" (25 years, social worker, diploma).

Below was the response from her husband in IDI:

"*After delivery women have to see the doctor as soon as possible to avoid bleeding because it can kill. It has killed many women in this village. They go for traditional treatment and they die. Doctors say women should go to hospital early after delivery for care to check bleeding and other things.*" (33 years, farmer, SSS)

ii. *The Less Knowledgeable*

Most of the less knowledgeable were aware of common signs such as nausea/vomiting, cessation of menses and weight gain. The statement below made by a woman in FGD was supported by her colleagues, and similar statements were repeated in other FGDs and IDIs involving the same category of participants.

"*To me I only realise that I am pregnant when I see my breast enlarging and my stomach becoming bigger and bigger. I don't agree that stoppage of menses is a sign of pregnancy because sometimes the menses can delay and if you eat food that does not contain enough pepper and ginger you can vomit and that does not mean you are pregnant. I have been vomiting and even my husband vomits as well.*" (40 years, mother of 4 children, SHS graduate).

This was her husband's reaction in the FGD:

"*It is serious. For me to be sure that a woman is pregnant the stomach must be very big. It is women who normally know those things. I think my wife knows better.*" (47 years, A'Level).

They had limited or no idea about the physiological causes of labour dystocia, prolonged labour and retention of placenta, as well as post-partum haemorrhage (PPH). Below are the response of a 45-year old woman and mother of 3 children and her husband in FGD on obstructed labour and retention of the placenta. These statements were supported by most members of the group.

"*Women who suffer before they born may have very big babies or they had sex with different men. Some people too have been cursed by their family gods if they sinned against them. It is the same way for those who experience delays in expulsion of the placenta. If the baby is big what about the placenta? It is because of sin. We have to be faithful in our marriages so that God will have mercy on us.*" (Wife).

"*I know many slim women who delivered very big babies but they did not suffer in giving birth. They didn't also struggle before the placenta came out. I think most women who suffer prolonged labour and delay of placenta expulsion only suffer the consequences of their sins and nothing else.*" (Husband, 47 years).

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Though some of them were informed about early postnatal care for preventing PPH, they were not aware of infections that women and babies contract during and after delivery.

> "*Yea, when my wife born I take her go to doctor after 2 days so that they can do my baby birth certificate and do weighing for him. Some women in this town die when they give birth some time. They are bleeding and go hospital late and they die.*" (Husband, 44 years, MSLC)

> "*Yes, I go for check up when I born. My first born I go after three days and my second born I go after naming ceremony for doctor to do my daughter papers and to do weighing. Oh!! I don't go early because I was not weak and my baby is strong. If you born and you are weak you for go and see doctor so that they give you medicine. If the baby too is weak you take it to the doctor to check and give drugs. Women that are weak after delivery go for doctor early or when the baby is sick when they born. They go for doctor to check the baby. Yes, that is what we do normally.*" (Wife, 40 years, MSLC).

b) Intra-Household Decision-Making

i. *The Knowledgeable*

Generally, amongst most knowledgeable couples, decision-making was the responsibility of both spouses. The men did not exercise their traditional gender powers, but rather gave the women some degree of liberty to take autonomous decisions where necessary without seeking approval from husbands. They considered women as the best people in the right position to make decisions towards maternity care since it is women who directly experience the conditions related to pregnancy and childbirth. These couples also mentioned that, even though some men may equally have knowledge about maternity, women usually attend maternal healthcare promotion programmes and are therefore more exposed to issues of pregnancy and childbirth as compared with men. Decisions taken by the knowledgeable were mostly joint decisions or non-tentative individual decisions taken by the women. There were no evidences of delays in decision-making by the knowledgeable. Most of them chose clinical care for treatment of complications and general check-ups during maternity. Below are responses of a couple in separate IDI sessions:

> "*I don't have the eyes to see what is in the woman's womb. I can only see the seriousness when my wife tells me. I cannot decide for my pregnant wife regarding where and when she should seek care. It is even better for women to decide for themselves.*" (Husband, 34 years old, SSS graduate).

> "*Sometimes I decide with my husband but in most cases I decide when, where and the type of care to seek. My husband always say that I should be better than him in determining the seriousness of what I experience. One thing is that I go to seek care whenever I need care without delays.*" (Wife, 28 years, SSS graduate).

ii. *The less knowledgeable*

The case of the less knowledgeable was almost a direct opposite of the knowledgeable. Though there were few traces of joint decision-making between spouses, the husbands were the final decision-makers. Unlike the knowledgeable, most husbands amongst these couples were conservative in exercising traditional gender powers. Women did not have the liberty to make autonomous decisions towards care-seeking. Whatever they decided were tentative and subject to approval by husbands. The statements below were made by a couple in FGD session, supported by the discussants and repeated in other FGD and IDI sessions.

> "*You see, certain things are done by men and some by women. Would you allow your son or daughter to decide for you? We are supposed to act as fathers to our wives and we must be accountable to any decision or action taken about their welfare including health issues. Decision-making is a sole responsibility of the family head. Yes, I listen to my wife but I make my decisions and implement them with her.*" (Husband, 42 years old, A' Level Graduate).

> "*As wives, we normally look up to our husbands to tell us what to do. We can't do anything without their approval. They are mandated to play the role of fathers so we are supposed to wait for them or listen to them. I always tell my husband what I experience then he decides whether I should go to hospital or for alternative care from the traditional practitioners.*" (Wife, 38 years, JSS graduate).

c) Interplay of Awareness, Culture and Gender

The decisions made by the knowledgeable were devoid of cultural and gender influences. In the light of this, most of the wives had the freedom to make autonomous decisions which resulted in quicker decision-making and positive clinic attendance. Amongst the knowledgeable, joint decision making was to grant women the listening ears and help the couple to make informed decisions. However, the less knowledgeable reached decisions based on the judgments of the men. Their delayed decisions were male-dominated, culturally determined and gender driven. Most of the less knowledgeable supported this statement, which run through various interviews.

> "*It is difficult to allow women to make decisions especially in pregnancy because some conditions will provoke the woman to move to the health facility where she would end her life. Certain pregnancy related conditions can best be treated with spiritual eyes or with herbs. Traditionally, women are not*

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supposed to make spiritual consultations and therefore, cannot be part of decision-making that is based on spiritual consultation outcomes." (Husband, 39 years old).

d) Background of Couples and Intra-Household Decision-Making

Apart from level of education and media exposure, which were the major sources of knowledge to the couples, other factors, such as religion, location of participants, age, occupation and experiences of maternity were important in determining the involvement of wives in decision-making towards care-seeking. Most Muslim husbands were more conservative and did not involve their spouses in decision-making, although some of them had adequate knowledge and much experience of maternity from their wives. Most Muslim couples supported this statement which was common across the datasets of IDIs and FGDs:

"*I am the man and head of the family. I have to take family decisions. Women only decide on what to cook for the family. ... She only told me she felt like giving birth. So, I took it upon myself to make a good decision about where to go and the time she should seek care.*" (52 years old, Muslim, A'level)

Members of traditional religion were also conservative, delayed decision-making, and denied their wives access to modern maternity care in some cases, as the primary choice of care amongst them was traditional practitioners. However, they were more liberal as compared with the Muslims because a few of them involved their wives in decision-making. Most Christians were more liberal and granted their wives autonomy in making and implementing decisions as compared with the members of traditional religion and Muslims. Irrespective of the level of awareness, urban couples were more liberal and the women were more autonomous. Generally, couples who worked together made joint and quicker decisions as compared with those who worked in different environments or workplaces. Although most of them worked together, farmers were more conservative and their decision-making process and outcome were influenced by gender norms and cultural factors.

Husbands whose wives had several pregnancy experiences were more liberal and their wives had opportunities in making decisions about care-seeking as compared with their counterparts without experiences. The men noted that they were comfortable with such women because they had both knowledge and experience to make informed decisions. Also, husbands with much experience of pregnancy were more democratic, as they sought and used the views of their wives in intra-household decision-making as compared with their colleagues with less experience. Joint decision making was more common amongst the younger couples as compared with older ones. Couples with younger wives and older husbands exhibited a different tendency. The older husbands treated their wives like children by marginalising them in decision-making.

e) Patriarchy, Matriarchy and Intra-Household Decision Making

The study observed that patriarchal and matriarchal communities exhibited differences in decision-making regarding the involvement of women and the type of decisions taken by the couples. Generally, couples from patriarchal society were less gender responsive, less democratic and more conservative, which resulted in male-dominated and culture-driven decisions. Data from the Muslim dominated Yendi Municipality and the Chereponi District of the patriarchal Northern Region of Ghana showed that women had limited opportunities to make autonomous decisions as compared with the women from matriarchal Awutu community. Men from Awutu communities gave women more power and autonomy in taking decisions. The women had the chances of finalising decisions which were not likely to be contested by husbands.

f) Implication for Maternal and Neonatal Healthcare

The knowledgeable took prompt and informed decisions for care-seeking, which resulted in early antenatal care attendance, mostly in the first month of the first trimester; timely attendance for institution-supervised delivery and postnatal care within the critical period as well as increased number of ANC and PNC visits. The data indicates that most of the women met the recommended ANC attendance of four visits with at least one visit in each trimester for women without serious risk factors. Most of them made about six visits before delivery. In an FGD a couple noted:

"*My wife made several ANC visits. The visits were timely as well including PNC visits. Because she knew I would not worry her she was able to go to the clinic as early as possible when she felt like giving birth in my absence. I only received a phone call from the clinic and joined her there till she delivered.*" (Husband, 48 years, No formal education).

My husband does not interfere in decisions. He allows me to do what I think is good for me and my unborn baby. I don't need to seek permission before going to the hospital for treatment." (Wife, 42 years, JSS graduate)

However, apart from delayed decision-making, the less knowledgeable couples took uniformed decisions, which had implications for the health of women and their babies. The poor decisions translated into poor clinic attendance in the form of low ANC visits, late ANC, delivery care and PNC. In separate IDIs, a couple shared their experiences:

"*... from the herbalist then we decided to carry her to the clinic but when we got there the midwife said it*

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was too late so we lost the baby and my wife sustained some injuries. Later, they had to clean her womb." (Husband, 45 years old, MSLC).

"*When I felt like going to toilet several times, I told my husband to take me to the clinic but he went out and when he returned he gave me some herbs. After some time he took me an herbalist but the baby delayed in coming out. Later, they carried me to the clinic but my baby died in the womb and I sustained injuries.*" (Wife, 39 years, JSS graduate).

IV. Discussion

The observation of this study concurs with the observations of previous studies that pregnancy is usually associated with complications that require proper care from the onset to the post-partum period (Graham, 1998; Stevens, 2000; GSS, 2015). To a large extent, appropriate care-seeking depends on individuals' awareness of signs of obstetric complications for making informed decisions (Pembe et al., 2009; Kabakyenga, Östergren, Turyakira & Pettersson, 2011). This study discovered that awareness of pregnancy and its related complications forms an essential component of intra-household decision-making. Couples' awareness of maternity was instrumental in spousal decision-making towards care-seeking, as the well-informed couples were able to make quicker and informed decisions. The couples' awareness did not only enable the husbands to actively involve their spouses in decision-making with equal opportunity, but also granted women the autonomy to make and implement decisions about their own health. This resulted in timely and regular clinic attendance amongst the knowledgeable which is essential for positive maternal and neonatal health outcomes (Ministry of Health, Uganda cited in Kabakyenga et al., 2011, pg.2; Comb Thorsen et al., 2012; Waiswa et al., 2010). The findings sustain the observation that gender role affects women's autonomy to make decisions about healthcare at the household level which, in turn, play out at the agency level (ICRW, 2008, 2010; WHO Commission on Social Determinants Health, 2008, 2010; Bougangue, 2017).

The findings also confirm previous studies that awareness of danger signs of obstetric complications enables women or the care-givers to take timely and appropriate actions towards healthcare (Pembe et al., 2009; Kabakyenga et al., 2011). The timely and regular clinic visits noticed amongst the knowledgeable positioned them for better chances of maternal screening and early treatment of complications. Most knowledgeable couples were able to stand dominant against gender norms and cultural beliefs to make informed decisions which is a pre-condition for better maternal outcome. The argument that awareness of pregnancy and its related complications translates into informed decisions and positive attitudes towards care-seeking is maintained in this study (ICRW, 2008, 2010, 2014). As shown in earlier studies, the awareness empowered the couples and guided them to take appropriate decisions during the maternity period (Bhutta, Darmstadt, Hasan & Haws, 2005; Hagman, 2013; Winta, 2013; UNDP/ICRW, 2014). However, women from the less knowledgeable families had higher risks of developing maternal complications or aggravating existing conditions because most of them missed early screening and identification of risks factors for timely intervention due to wrong decisions that led to late clinic attendance (WHO, 2013; GSS, 2008, 2009, 2015).

The observed entrenched gender norms and cultural adherence amongst the less knowledgeable and some of the knowledgeable had a serious repercussion on decision type as well as maternal clinic attendance. This observation supports the findings in previous studies that have shown evidences of gender inequalities in decision-making towards maternal healthcare (Tsikata, 2007; ICRW, 2008, 2010, 2014). The views of women about their own health were central in determining the timing and choice of care type, which guarantees the need for gender equality and women's empowerment in healthcare decision-making at the household level. The marginalisation of women in decision-making and the normalisation of cultural and traditional gender norms as observed in this study had a serious implication for maternal health, particularly amongst the less knowledgeable who entrusted the decision-making power to the sole hands of men. Some husbands did not count women's experience of pregnancy-related symptoms as important for decision-making, and this resulted in some women developing serious complications and injuries during delivery with others losing their lives in the process of giving life.

Self-medication and the use of herbs during pregnancy as this study observed, are associated with health risks in the form of pregnancy termination such as premature birth, spontaneous abortion and stillbirth (Cnattingius et al., 2000; Kirsten, Ulrik, Bodil, Morten, & Tine, 2003; Abasiubong et al., 2012; Liao et al., 2015). The herbs may contain substances such as caffeine, which has adverse effects on the growth and development of the foetus (Bakker et al., 2010; Creanga et al., 2012). There was no guarantee of purity and safety of the herbs used by the women, because they were not subjected to laboratory investigations to ascertain the efficacy, composition, expiry dates as well as the side effects (Lapi et al., 2010). Besides, traditional practitioners lack the skills and equipment to save women's lives in the event of obstructed labour or delay in placenta expulsion, which were evident amongst the less knowledgeable. This exposes the women and their unborn babies to risks of further complications which may result in injuries, lifetime disabilities and deaths

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(WHO, 2001, 2013; GSS, 2008; Neilson, Lavender, Quenby & Wray, 2003). As highlighted in the findings, some of the maternal complications, injuries and deaths observed in this study were mainly due to uninformed decision-making that led the women to non-professionals who could not give the needed treatment.

Another finding of this study is that the women's decision-making power about reproduction and sexuality was extremely limited, particularly amongst the less knowledgeable couples. The exclusion of women from decision-making concerning their own health is a violation of women's reproductive rights (Republic of Ghana, 1992; African Union, 2006). Women are the direct objects of complications arising from pregnancy and childbirth, and, therefore, must be given the autonomy to take non-tentative care-seeking decisions. The fundamental human rights guarantee women the right to make decisions and to access healthcare services of their choice (Republic of Ghana, 1992). Studies show that if women are given the power, they make meaningful decisions that can positively affect their lives (Babalola & Fatusi, 2009; Hagman, 2013). However, differences in status between women and men lead to differences in opportunities to claim, benefit from, and enjoy human rights, including the right to decision-making and health (WHO, 2013, 2014).

The interplay of couples' awareness of signs and complications of maternity with gender norms and cultural beliefs influenced the involvement of female spouses in intra-household decisions and the type of decisions they took. Whilst the educational level of couples remains important and necessary for informed decision-making, the study also noticed that couples' exposure to the media as well as their inclination to cultural and gender norms impacted their decisions. Irrespective of awareness, some couples considered decision-making as a sole responsibility of men, and the women relied fully on the decisions made by their spouses for care-seeking. However, despite the cultural, religious and gender influences, the study observed a seeming changing pattern of men's behaviour in intra-household decision-making, with a gradual shift from the hitherto male-centred decision-making to joint and female autonomous decision-making even amongst some illiterate couples. This behavioural pattern was evident, particularly amongst the Christian husbands and the believers of traditional religion. Whilst this is positive and essential for improvement of maternal healthcare (ICRW, 2010, 2014), the norms and principles governing marriage amongst the Muslims, particularly regarding gender ideologies, were observed to be very strong and resilient.

Media exposure had a far-reaching impact, particularly on the illiterates and rural couples. Some of the knowledgeable gained awareness from local radio programmes which were accessible to them even in their farms. The illiterate couples in the urban communities had more knowledge than their rural counterparts due to exposure to multiple sources of the media and information (different TV and Radio stations/programmes) and the opportunity to interact with literates and experienced people from whom they tapped knowledge.

Spousal age difference emerged as a crucial factor in intra-household decision-making. Men who were married to very young women as compared to their ages considered their wives as incapable of taking appropriate decision. Most of the participants aged between 25 and 35 years who had at least secondary education were in support of joint decision-making and female autonomous decisions. However, regardless of age and experience, female educational attainment was central to women's involvement in decision-making. Female spouses who had at least secondary education were more involved in decision-making as compared with their illiterate counterparts, as well as those who had basic education. This observation maintains the importance of formal education, which is often used as a proxy for knowledge, informed decisions and empowerment, as well as positive behaviour towards care-seeking though there were evidences of exceptional cases (Preston, 1989; McAlister & Baskett, 2006; GSS, 2008, 2009, 2015; Hagman, 2013; Perumal et al., 2013; UNFPA/ICRW, 2013, 2014; Bougangue, 2017; Bougangue & Ling, 2017).

The less knowledgeable women, particularly those from rural areas with much experience of pregnancy and antenatal counselling, were not well-informed about maternity complications, and their implications were observed to be attributable to poor messaging during ANC counselling. This maintains previous discoveries that poor messaging during ANC counselling contributes to low knowledge about pregnancy and childbirth - a recipe for poor maternal health (Perumal et al., 2013). This reinforces the view that dialectical differences and poor communication create barriers to women during antenatal counselling, and these deny women the desired knowledge, thereby leading to lack of perceived need for clinic attendance (Andersen & Newman, 2005; Bougangue & Kumi-Kyereme, 2015).

Most of the couples in the Muslim-dominated patriarchal societies of the Northern Region entrusted decision-making to the hands of men. They were more influenced by gender and cultural norms as compared with their counterparts from the matriarchal Awutu community in the south most of whom gave autonomy to female spouses to take and implement decisions towards care-seeking. In effect, the Awutu female spouses put up better attitudes towards care-seeking as compared with their northern counterparts. This caused late clinic attendance and denial of professional care in some instances, which partly explains the persistent high maternal and child morbidities and mortalities

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observed in the Northern Region (GSS, 2008, 2009, 2015).

V. Conclusions

The study observed that awareness of signs of obstetric complications as well as their implications is an essential ingredient in reaching well-informed decisions towards care-seeking. However, cultural, religious and gender norms may collide with couples' awareness to adversely influence the involvement of female spouses in decision-making, which has far-reaching implications for health outcome. Adherence to cultural and gender norms, and the associated male-dominant decision-making were acts of disempowerment and marginalisation of women with the tendency of making uninformed decisions and the resultant negative health outcomes.

Healthcare promotion programmes should be directed towards the dangers of cultural, religious and gender norms around maternity care and the need to empower women to make decisions about their own health and that of their babies. Also, there should be public education on pregnancy and childbirth and the associated benefits and dangers to equip couples, especially men, to recognise pregnancy-related complications for informed decision-making.

This study established that couples' awareness of signs of obstetric complications is essential for female spousal involvement in decision-making as well as reaching well-informed decisions for positive maternal outcome.

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Massive Ascites Complicating Severe Preeclampsia : A Case Report

By Bharathi K.R, Vijayalakshmi S & Mahendra G

Introduction- Pre-eclampsia earlier known as Toxemia in pregnancy/pregnancy induced hypertension is primarily a endothelial disorder which is thought to be triggered by the placenta.[1] It affects about 4-8% of all pregnancies. Hypertensive disorders in pregnancy remains one of major component of the lethal triad in causing maternal mortality even in the era of modern obstetrics with the advent of newer management options and intensive care facilities being available.[2] The complications associated with pre-eclampsia are estimated to be around 20%. Complications like intracranial hemorrhage, cerebral edema, pulmonary edema, renal failure, global haemolytic tendency, HELLP syndrome and maternal ascites are all found in pre-eclampsia. The finding of presence of fluid in various body cavities is due to increased endothelial permeability and microvasular damage which is not unusual.[3,4] Some amount of fluid in peritoneal cavity is seen frequently seen in pre-eclamptic women but presence of massive ascites is a rare complication and needs cautious management.

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I. Introduction

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II. Case Report

A 19year old primigravida with h/o 9 months of amenorrhea with good perception of fetal movements and regular antenatal checkups was referred from a private hospital to our antenatal OPD at AIMS, BG Nagara in view of high blood pressure readings. She gave h/o pedal edema and high blood pressure since 2 months for which she was on treatment with tab. Nicardipine 5mg thrice daily which has been increased to 10 mg thrice daily since 3 days. No h/o imminent symptoms. On examination, there was no pallor, icterus. Bilateral pitting type of pedal edema present. Pulse rate 94/min, BP was 160/120mmhg, respiratory rate 22/min, regular. Cardiovascular & respiratory system examination were within normal limits. Abdominal examination showed abdominal wall edema, gross maternal ascites with fluid thrill, 28weeks size uterus, FHS couldnot be localised clinically but fetal cardiac activity and rate noted with the help of bedside scan. Vulval edema present. Vaginal examination revealed uneffaced and closed cervical os and diagnosis of 36weeks gestation with severe preeclampsia with severe IUGR with oligohydramnios with gross maternal ascites was made. Urine albumin was 4+. Serum uric acid 6mg/dl. Complete blood count, blood urea, serum creatinine, serum bilirubin, ALT, AST, LDH were within normal limits. Fundoscopy revealed grade I hypertensive retinopathy changes. She was given 10mg Nicardipine stat dose and 12mg betamethasone injection was given. Decision for caesarean section was taken in view of severe IUGR and oligohydramnios. Under spinal anesthesia, caesarean section was done and delivered a live preterm male baby weighing 1.5kg. 2litres of ascitic fluid drained intraoperatively, BP 140/100mmhg. Immediate postoperative period was uneventful. She was started on clear liquids orally after 12 hours, BP was 130/100mmhg, pulse rate 88/min.

On 2nd postoperative day patient developed abdominal distension with breathing difficulty. On examination pulse was 116/min, BP 130/100mmhg, with RR 24/min. Abdomen soft, nontender, ascites +. Ultrasonography revealed gross ascites and bilateral mild pleural effusion. Echocardiogram was normal. Serum albumin was 2.6g/dl, all other investigations were within normal limits. Patient was shifted to intensive care unit. Ascitic fluid tapping done. Strict input/output charting maintained. Tab Nicardipine 10mg thrice daily continued. On 3rd and 4th post op day she continued to have tachycardia and abdominal distension. High protein diet started. From 5th postop day the tachycardia started settling down and also the blood pressure with BP 140/90mmhg, abdominal distension also started reducing which was monitored by measuring abdominal girth. Complete hemogram, Blood urea, creatinine, AST, ALT, LDH, serum bilirubin were within normal limits. By 10th day distension reduced completely. Review ultrasound revealed no pleural effusion but mild ascetic fluid. Nicardipine was stopped on 15th day and BP monitoring was done which was within normal limits. She was discharged on 20th day in stable condition with instructions for weekly follow up. Review follow up was uneventful with normal BP readings.

III. Discussion

Pre-eclampsia is a multisystem disorder characterised by the involvement of global microvascular system associated with endothelial dysfunction. Out of all the complications known to occur

Author α ρ: Asst professor, AIMS, BG Nagara.
e-mail: bharathikr84@gmail.com
Author σ: Prof and head, dept of OBG, AIMS, BG Nagara.
Author: Postgraduate AIMS, BG Nagar.

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in pre-eclampsia, ascites is a rare complication. Fluid in the peritoneal cavity is a frequent finding in pre-eclamptic women but massive ascites is very rare and only few cases have been reported in the literature. Incidence of ascites in pre-eclampsia is 1 in 1000 patients. Fluid in multiple body cavities in pre-eclampsia is thought to be due to increased capillary permeability (capillary leak syndrome), portal hypertension, hypoproteinemia due to proteinuria and altered albumin/globulin ratio.[5]

Cong and Wang conducted a study in 23 patients with pre-eclampsia and ascites where they found albumin/globulin ratio <1.5 in all patients.[6] The finding of altered albumin/globulin ratio was thought to reduce the intravascular oncotic pressure leading to transudation of serum to various body cavities predominantly peritoneal cavity.[7]

A case of massive ascites in pre-eclampsia with bilateral hydrothorax reported by Ashmore et al reveals the use of intraabdominal drain to monitor the ascetic fluid production.[8]

A case series conducted by Woo et al in pregnancy with severe-eclampsia and ascites reported rapid deterioration in maternal condition with rise in the blood pressure associated with increasing proteinuria requiring early termination of pregnancy.[9]

IV. Conclusion

Ascites in preeclampsia is a rare complication which need cautious management to avoid complications of massive ascites and hydrothorax like respiratory distress and cardiac compromise. Patients need to be monitored well in intensive care set ups and decision regarding termination of pregnancy should be taken based on the clinical scenario rather than making a decision for early termination of pregnancy.

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Incidence, Clinical Characteristics and Outcome of Unexpected Uterine Sarcoma after Hysterectomy for Uterine Mass: A Retrospective Study of 774 Cases

By Monika Jindal & Rekha Ratnani
Chandulal Chandrakar Memorial Medical College

Abstract- *Background:* Women often require a hysterectomy via laparotomy or laparoscopy. Morcellation is often necessary to perform a laparoscopic surgery. The objective of this study is to determine the incidence of unexpected uterine sarcomas (UUSs) after hysterectomy and to reduce the occurrence and avoid the morcellation of UUSs by analyzing their characteristics.

Methods: Women who had a hysterectomy for various reasons in Chandulal Chandrakar Memorial Medical College, Durg, India between January 2014 and September 2016 were selected for the study, and their clinical characteristics were analyzed.

Results: During the period, 5 UUSs were found in 774 cases, and the overall incidence was 0.65%. Most of the UUSs were stage I (80%), which occurred more commonly (80%) in women aged 40–49. Abnormal uterine bleeding (60%) was the main clinical manifestation. The margins of most UUSs (80%) were regular, which may cause UUSs to be misdiagnosed as uterine fibroids.

Keywords: *laparoscopy, morcellation, uterine sarcoma, uterine fibroid, hysterectomy.*

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Abstract- ***Background:*** Women often require a hysterectomy via laparotomy or laparoscopy. Morcellation is often necessary to perform a laparoscopic surgery. The objective of this study is to determine the incidence of unexpected uterine sarcomas (UUSs) after hysterectomy and to reduce the occurrence and avoid the morcellation of UUSs by analyzing their characteristics.

Methods: Women who had a hysterectomy for various reasons in Chandulal Chandrakar Memorial Medical College, Durg, India between January 2014 and September 2016 were selected for the study, and their clinical characteristics were analyzed.

Results: During the period, 5 UUSs were found in 774 cases, and the overall incidence was 0.65%. Most of the UUSs were stage I (80%), which occurred more commonly (80%) in women aged 40–49. Abnormal uterine bleeding (60%) was the main clinical manifestation. The margins of most UUSs (80%) were regular, which may cause UUSs to be misdiagnosed as uterine fibroids.

Conclusion: The incidence of UUSs after hysterectomy for uterine fibroids was low, and their clinical characteristics are atypical. It is necessary and very critical to make a complete and cautious preoperative evaluation to reduce the occurrence and avoid the morcellation of UUSs.

Keywords: laparoscopy, morcellation, uterine sarcoma, uterine fibroid, hysterectomy.

I. Introduction

Uterine fibroids are one of the most common types of pelvic tumors in women. Various treatments are available for the management of uterine fibroids, such as having a hysterectomy or a myomectomy. The surgical route is shifting from an abdominal to a laparoscopic approach, which confers a more rapid recovery and fewer perioperative complications.[1] Morcellation of the specimen is often necessary to perform a laparoscopy.

Uterine sarcoma is a rare, malignant tumor affecting the female genital system that accounts for only 1%–3% of uterine malignancies. The 5-year survival rate is approximately 30%.[2,3] The degree of malignancy is high and the prognosis is poor. Inadvertent morcellation of unexpected uterine sarcomas (UUSs) is a surgical risk of laparoscopic hysterectomies and myomectomies. Evidence suggests that morcellation of UUSs potentially upstages the disease, which portends a poor prognosis.[4,5] The lack of specific symptoms, signs, or diagnostic techniques for preoperative differentiation from uterine fibroids results in most patients being diagnosed after surgery. If a uterine sarcoma is mistakenly diagnosed as a uterine fibroid and is morcellated via laparoscopy, serious consequences may arise.

The objective of this study is to determine the incidence of UUSs after hysterectomy for uterine fibroids. Until now, few studies have described the characteristics of UUSs in detail. This study is also designed to help reduce the occurrence and avoid the morcellation of UUSs in future by analyzing their characteristics.

II. Materials and Methods

a) Case selection

This study was approved by the Institutional Review Board at CCM Medical College, Durg, India and all subjects provided informed consent. Women who had a hysterectomy in CCM Medical College, Durg, India between January 2014 and September 2016 were selected for the study. The average patient age was 48.20±7.64 years. Among them, patients who were diagnosed with uterine sarcomas based on postoperative pathology were also selected. Their median age was 41 years. Data analysis was performed to determine the incidence of UUSs. Finally, we reviewed the patient's clinical manifestations, laboratory tests, imaging studies, intraoperative findings, surgical pathologic stage, postoperative pathology, and prognosis.

b) Statistical analysis

Statistical analysis was performed with SPSS 19.0 software (IBM Corporation, Armonk, NY, USA). All results are expressed as the mean ± standard deviation. The Pearson's chi- square test was used for

Author α σ: Chandulal Chandrakar Memorial Medical College, India.
e-mail: drmonickajindal@gmail.com

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comparison of percentages between the groups. Statistical significance was assumed at a $P \leq 0.05$.

III. Results

a) Incidence of unexpected uterine sarcomas

During the period, 5 UUSs were found in 774 cases, and the overall incidence was 0.65%. Among the 5 patients, open surgery was performed on 4 patients (80%), accounting for approximately 0.01% of 625 laparotomies. There was one laparoscopy (20%), accounting for approximately 0.01% of 149 laparoscopies. There was no statistical difference ($P=1.05$) regarding the incidence of UUSs between laparotomies and laparoscopies.

The details of the UUSs are shown in Table 1.

S.no	Age (years)	Clinical Presentation	Associated Co-morbidities	Type and Stage	Treatment Received	Outcome
1	49	Lump Abdomen (24 weeks)	Hypertension, Sickle Cell disease	Leiomyosarcoma 3	Abdominal Hysterectomy with Bilateral Salpingio-oopherectomy With regional Lymphadenectomy	Lost to follow-up
2	41	AUB	Nil	Leiomyosarcoma 1	Total Laparoscopic Hysterectomy	Died
3	23	AUB Dysmenorrhoea	Anemia	Endometrial Stromal Sarcoma 1	First Surgery – Myomectomy Second Surgery – Wertheim' s Hysterectomy	Chemotherapy
4	40	Acute Abdomen	Nil	Carcinosarcoma 1	Radical Hysterectomy with Bilateral retroperitoneal pelvic lymphadenectomy	Chemotherapy and Radiotherapy completed
5	45	AUB	Nil	Leiomyosarcoma 1	Total Abdominal Hysterectomy with Bilateral Salpingio-oophorectomy	Chemoradiotherapy

The results showed that 4 patients were between 40 and 49 years, comprising the highest proportion (80%) of the 5 UUSs. There was only one patient aged 23 years, accounting for 20%. Thus, it can be seen that UUSs occurred more commonly in women aged 40–49, but patients aged 21–39 and aged 50–59 cannot be ignored.

b) Clinical manifestations

The clinical manifestations of uterine sarcomas are nonspecific. Classically, uterine sarcomas are always present as rapidly growing pelvic masses, which may be accompanied by abnormal uterine bleeding and abdominal or pelvic pain.[6,7] In our study, 3 UUSs (60%) presented with abnormal uterine bleeding (menorrhagia, menostaxis, and irregular uterine bleeding), 1 UUSs (20%) presented with acute abdomen, and one UUS (20%) presented with rapidly growing pelvic masses. Abnormal uterine bleeding was the main clinical manifestation. A rapidly growing pelvic mass may be an indication of uterine sarcoma.

c) Laboratory tests and imaging studies involving unexpected uterine sarcomas

Of the 5 UUSs, laboratory tests for tumor markers, especially CA-125, were performed on 2 (40%). Only one case had high CA-125 values i.e. 51.2 mIU/mL, and in other it was found to be normal i.e. 23.0 mIU/mL. The sensitivity of CA-125 for uterine sarcomas is only 50% and its specificity is poor. We concluded, therefore, that CA-125 contributes minimally to the early diagnosis of uterine sarcoma.

The 5 UUS cases all underwent ultrasonic examinations, and the preoperative ultrasound diagnosis was a uterine fibroid in 4(80%) and ovarian mass in 1 (20%). The diameters of the pelvic mass ranged from 6 to 15 cm and the median value was 7 cm. The diameter of the mass in 3 cases (60%) was less than 8 cm, in one case (20%) from 8 to 10 cm, and only one case (20%) was above 10 cm. Among the 5 UUSs, only one case (20%) had irregular margins. The margins of typical uterine sarcomas are mostly nodular, irregular, or ill defined, and the uterus is significantly enlarged, but the size and margins of most UUSs prompted by ultrasonography in this study were atypical, which may cause UUSs to be misdiagnosed as uterine fibroids. Color Doppler flow imaging of one of the 5 (20%) UUSs demonstrated rich blood flow signals, and degeneration of uterine fibroids was found in one of 5 (20%) cases. A rich blood flow signal around a pelvic mass and the degeneration of a uterine fibroid may suggest that more methods are needed to rule out the possibility of a uterine sarcoma.

In our study, 2 out of 5 UUSs (40%) were examined by computed tomography (CT). The preoperative CT diagnoses was uterine fibroid in one and ovarian mass in one. CT cannot be used to help distinguish uterine sarcomas from uterine fibroids. This study showed that it is more difficult to distinguish between benign degenerating uterine fibroids and malignant uterine sarcomas. When the pathology reports were available, the CT images were reviewed again by the pathologist, but a preoperative CT diagnosis of a uterine sarcoma still could not be made so easily. In such patients, alternative treatment options should be carefully considered.

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d) Surgical stage, postoperative pathology, and the prognosis of UUSs

According to the postoperative pathology report after the first operation, there were three leiomyosarcomas (60%), two low- grade endometrial stromal sarcomas (ESSs, 40%). According to the FIGO (International Federation of Gynecology and Obstetrics) 2009 staging for uterine sarcomas, the number of uterine sarcomas for stages I, II, and III after the first operation was four, zero, and one, respectively, thus accounting for approximately 80%, 0%, and 20% of the five UUSs. When postoperative pathology was confirmed, one case (20%) underwent a second operation. Stage I was the first operative stage. This case underwent laparoscopy that was converted to laparotomy during the first surgery. The time interval between the two operations was 15 days.

The follow-up percentage was 60%. The follow-up time was 4–11 months, and the median follow-up time was 7 months. All these patients are of Stage 1 sarcoma. One case died after 9 months of diagnosis and was found after a telephonic call as she was lost to follow-up. She took 2 cycles of chemotherapy. One more case lost to follow-up and is not traceable.

IV. Discussion

A number of studies[10,14,15] have reported a poor prognosis for uterine sarcomas closely related to the clinical stage and the method used in the primary operation. In this study, the staging of most UUSs (80%) is stage I, which may indicate a good prognosis, but how to make an accurate diagnosis and choose an appropriate treatment is critical. To reduce the occurrence of UUSs and the risk of spreading UUSs by laparoscopic morcellation, the method used for the preoperative diagnosis of a uterine sarcoma is very important. Brohl et al[16] found the risk of UUSs varied significantly across age groups, and the risk of uterine sarcoma ranged from a peak of 10.1 cases per 1,000 for patients aged 75–79 years to, 1 case per 500 for patients aged, 30 years. However, our study found that UUSs occurred more commonly in women aged 40–49. Abnormal uterine bleeding was the main clinical manifestation, and cases with no symptoms cannot be ignored. A rapidly growing pelvic mass may be indicative of a uterine sarcoma. The size and margins of most UUSs as suggested by ultrasonography were atypical, and UUSs can be easily misdiagnosed as uterine fibroids. Attention should be paid to a rich blood flow signal around a pelvic mass and the degeneration of uterine fibroids, and more methods are needed to rule out the possibility of uterine sarcomas. CT may have a role in the evaluation of pelvic masses. In our study, CT was of no use as it was unable to differentiate between fibroids and sarcomas.

When the pathology reports were available, the pathologist reviewed the CT images again, but it was still difficult to make a preoperative CT diagnosis of a uterine sarcoma. This told us that it is more difficult to distinguish between benign degenerating uterine fibroids and malignant uterine sarcomas. When the malignant potential of a uterine mass is uncertain, alternative treatment options should be carefully considered.

A number of studies[20–25] have shown that the incidence of UUSs ranges from 0.09% to 0.49% among women undergoing benign hysterectomy or myomectomy. In this, the incidence of UUSs during hysterectomy performed for various reasons was 0.65%, and there was no statistical difference ($P=1.04$) in the incidence between laparotomy and laparoscopy (0.01% vs 0.01%).

V. Conclusion

In conclusion, the incidence of UUSs after hysterectomy and myomectomy was low and their clinical characteristics are atypical. It is critical to make a complete and cautious preoperative evaluation to reduce the occurrence and avoid the morcellation of UUSs. Due to the limitations of sample size, further research should be carried out to assess the impact of morcellation on the prognosis of UUSs and summarize the clinical characteristics of UUSs to avoid the risk in future.

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Effect of Pregnancy and Mode of Delivery on HPV Infection and on Cervical Cytological Changes

By Lizhou Sun, Preetam Kona Herkanaidu & Purnima Mohur

Nanjing Medical University

Abstract- *Background:* To know if the hormonal changes during pregnancy and the mode of delivery affect HPV (human papillomavirus) infection and on cervical cytological changes concerning the rates of persistence, progression and regression in the postpartum period following hormonal normalization.

Methods: A prospective study was carried out on 57 pregnant women who attended the Nanjing Maternity and Child Health Care Hospital between 2015 and 2017 who were positive for cervical cytological changes and HPV during their antenatal visits by TCT (PAP smear) and hybrid capture test2 respectively. Initial and postpartum results of these tests were compared where the rates of persistence, progression and regression of HPV and the cervical cytological changes were analyzed. For analysis of the results, a control group of 57 nonpregnant patients from the gynecological department was included and followed in this study.

Results: The postpartum evaluation of the pregnant cohort revealed a significantly higher tendency to spontaneous regression as compared to the non-pregnant control group (59.9% versus 31.6 %, p = 0.005) and the mode of delivery did not affect cervical cytological changes and HPV infection (p=0.140).

Conclusion: The high regression rate suggests that in the absence of invasive disease, definite management of abnormal cervical cytology can be carried out in the postpartum period.

EFFECTOFPREGNANCYANDMODEOFDELIVERYONHPVINFECTIONANDONCERVICALCYTOLOGICALCHANGES

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Effect of Pregnancy and Mode of Delivery on HPV Infection and on Cervical Cytological Changes

Lizhou Sun [α], Preetam Kona Herkanaidu [σ] & Purnima Mohur [ρ]

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Conclusion: The high regression rate suggests that in the absence of invasive disease, definite management of abnormal cervical cytology can be carried out in the postpartum period.

I. Background

HPV infection is highly prevalent in sexually active women worldwide, mostly in the non-vaccinated females, and even among those presenting normal cytology [1]. It is one of the most common sexually transmitted infections in the world and most sexually active women will be infected with HPV at least once during their lifetime, with the majority of infections cleared within two years [2,3]. Based on their association with cervical cancer (CC), HPV genotypes are classified as low-risk or high-risk [4]. High-risk (HPV) is a small DNA tumor virus that infects the mucosal squamous epithelium and causes various malignant diseases in humans, including cancers of the cervix [5]. It is well established that persistent infection with high-risk HPV genotypes is the necessary although not a sufficient cause of CC [6]. The involvement of other factors, in addition to HPV, is needed to induce cervical carcinogenesis and adequate immune response is crucial for HPV clearance while immune deficiency favors viral persistence and cervical cancer [7, 8]. Only 10-15% of women develop a persistent infection, which is an important risk factor for cervical carcinogenesis [9]. HPV persistence, even for a short time, has been associated with higher risk for cervical intra-epithelial neoplasia, compared to women without a history of HPV infection [10, 11]. After initial infection, HPV clearance is very frequent in the first six months, with rates of 50-70% per follow-up year [12, 13].

Physiological changes in immunity and other biological parameters (for example, changes in the levels of different hormones) during pregnancy and postpartum may change the natural history of HPV infection and most authors have found a reduction in HPV positivity during the postpartum period [14]. The aim of this study is to find out how pregnancy affects the cervical cytological changes and the natural history of HPV infection.

II. Materials and Methods

A prospective study was carried out in Nanjing Maternity and Child Health Care Hospital from January 2015 to December 2017.

The inclusion criteria were as follows;

- Adults aged 18 to 30 years with given consent
- Pregnancy in the first 24 weeks
- Females:

i. with positive TCT (Thin prep cytology test) and HPV positive
ii. having only one partner
iii. who do not smoke and do not indulge in alcohol or substance abuse.

The exclusion criteria were as follows;

- All immunosuppressed patients
- Patients who are or were known cases of cervical carcinoma
- Patients who had previous surgeries of the cervix

Author α: Department of Obstetrics, Nanjing Maternity and Child Health Care Hospital, Affiliated with Nanjing Medical University, Jiangsu Province, Nanjing, China. e-mails: lizhou_sun121@sina.com, pkherkanaidu@yahoo.com
Author σ: Department of Obstetrics, Nanjing Maternity and Child Health Care Hospital, Affiliated with Nanjing Medical University, China.
Author ρ: Department of Obstetrics and Gynecology, JN Hospital, Mauritius.

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- Females who are known to be HPV positive and positive cervical cytology before pregnancy

All women up to 24 weeks of gestation attending the antenatal clinic for the first time in their pregnancy had TCT done. Here, after insertion of a vaginal speculum, we used plastic broom to collect material from the endocervix and this was then immediately distributed in a buffer solution by shaking the broom vigorously. The samples were then transported to the Molecular Biology. Those with positive cytological changes, that is positive PAPS smear, were asked in their next review to do the hybrid capture test 2 for HPV testing. These patients were seen as per the normal ANC review and no treatment was given for HPV positivity. However, after delivery, all those patients who were positive (ASCUS+HPV positive) were asked to repeat the TCT and the hybrid capture test 2 to know their status postpartum .The mode of delivery included both normal vaginal delivery and Caesarian section (Cs). We repeated the tests after a minimum of six weeks, that is the puerperium, when all the hormone levels and physiological changes during pregnancy return back to normal. During the same period of study, we followed a control group of 57 patients from the gynecological department with initial positive PAP smear(ASCUS-atypical squamous cell of undetermined significance) and positive hybrid capture test 2(HPV positive). The mean period for the repeat tests for both pregnant and nonpregnant patients was 40 weeks. In this study, regression was defined as those cases where the first cervical cytology and HPV test was positive but became negative after the second test. Persistence were those cases in which both the first and the second tests were positive. Progression were those cases which worsened on the second test based on the cytological findings.

We used SPSS 19.0 statistical software for statistical analyses. p-values of <0.05 were considered statistically significant. The impact of pregnancy and the mode of delivery on regression persistence and progression were assessed using the Chi-squared test. Binary logistic regression analysis was performed to calculate odds ratios and 95% confidence interval.

III. Results

Within this study period, a total of 114 patients with proven cytological changes and HPV infections were included in the analysis. Among them, 57 were pregnant and 57 who were nonpregnant served as the control group. As far as the effect of the mode of delivery is concerned, as shown in table 1, where the vaginal delivery rate was 75.4%, the regression rate was 65.1%. For the Cs group, the regression rate was 42.9%. Based on the p-value which was 0.140, that is >0.05, we did not find any significant difference between the effect of Cs and vaginal delivery on regression of HPV and its cytological changes. On the other hand, as shown in table 2, in the group of pregnant women, the overall regression rate was 59.6%, which was higher than the regression rate in the control group that is 31.6%. Based on the chi-squared test, the p-value was 0.005 which is statistically significant and supports the fact that pregnancy affects the regression (that is a higher regression rate postpartum) of cervical HPV infection and its associated cytological changes.

Table 1: Comparison of effect of mode of delivery on HPV infection

Mode of delivery	Persistence	Regression	X^2	P
Cs	8	6	2.174	0.140
Vaginal delivery	15	28		

Table 2: Comparison of effect of pregnancy on HPV infection

	Persistence	Progression	Regression	X^2	P
Pregnant	23	0	34	10.78	0.005
Non-pregnant	36	3	18		

Table 3: Characteristics associated with all the 114 pregnant and non-pregnant patients (multivariable analysis)

Variables	OR	OR 95% CI	
		Low	Up
Regression	1		
Persistence	0.395	0.186	0.839

IV. Discussion

The present study revealed high spontaneous regression in pregnant women. No cases of progression to higher grades cytological changes or invasive disease during the postpartum follow up period was found. These data support the opinion that once invasive disease can be excluded by colposcopy and CGB, definitive therapy in pregnant women can be deferred until after delivery. The initial obstetrical consultation provides an excellent opportunity to detect patients with abnormal PAP smears [15, 16, 17]. Historically, women with high-grade CIN were treated by cone biopsy during pregnancy [18, 19, 20]. Several studies reported that cone biopsy in pregnancy is associated with an impaired pregnancy outcome [21, 22]. Other reports showed that loop electrosurgical excision procedures are safe during pregnancy with a miscarriage rate <1 % [23]. Due to the low rates of progression during pregnancy, it is nowadays accepted that most patients may safely undergo expectant management if an invasive disease has been ruled out [24, 25]. Within the last decades, several authors studied the natural history of HPV diagnosed during

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pregnancy with different outcomes, shown in table 4. The present study reports a significantly high postpartum regression rate of HPV in the group of pregnant patients that is 59.6%. The high regression rate is in accordance with recent previous studies, which report regression rates between 37 and 74 % for pregnant women at the time of postpartum follow up [26, 27, 28, 29, 30, 31, 32].

Table 4: Studies with reported outcomes

Author	Regression (%)
Lurain [32]	77.4
Yost [26]	69.3
Vlahos [27]	61.6
Paraskevaides [28]	37.5
Serati [31]	47.3

Many theories to explain these high regression rates can be found in the recent literature and among them most commonly the ones discussed below. Possible biological mechanisms for this could be that the raised levels of estrogen and progesterone during pregnancy which bring the following changes; the vaginal flora specifically presents an imbalance that, together with the dampness particular to that area, favors the development of infectious agents, including HPV. Also, during pregnancy, there occur anatomical modifications of the genital tract such as hypertrophy and congestion of the cervix, which increase, and is followed by metaplasia. The squamocolumnar junction undergoes alterations and maintains the transformation zone (TZ) on the exo-cervix (ectopy) for many years as a result of which this area of immature squamous metaplasia becomes more susceptible to the development of HPV infections and pre-neoplastic lesions [33]. These hormones also alter the local immune microenvironment of the cervix and sensitize the TZ to cervical cancer formation. The squamous epithelium of the cervix is composed of keratinocytes (primary target of HPV) and a type of immature dendritic cell (DC), the Langerhans cells (LC), which are important for the immuno-surveillance of the squamous epithelium [34].

Estradiol and progesterone influence the APC (antigen-presenting cell) functions of DC, with estradiol suppressing APC function, which may be due to decreased recruitment of DC or due to hormone-induced TGF- production that maintains DC in an immature state [35]. Moreover, in the transformation zone, estradiol has a high rate of conversion to 16 alpha hydroxyestrone [36, 37] which covalently bind and activate ERα (Estrogen receptor alpha). ERα is necessary for the genesis and continued growth of cancer and its expression in stromal cells is required for disease progression [38- 40]. The activated ERα is assumed to bind to responsive elements within the LCR (Long control region) and further induce E6 and E7 transcription to maintain HPV gene activity [37, 41]. Thus, it is hypothesized that both HPV and estradiol enhance the effects of each other, either directly through functional EREs (Estrogen responsive elements) in the viral genome or indirectly encourage uncontrolled cellular proliferation, thus enhancing malignant proliferation [42]. This synergistic combination of estrogen and HPV is the strongest factor in such carcinogenic transformations [38, 43-46]. Also, estrogen has a mitogenic activity which can be amplified by viral oncogenes [47]. It has been shown to stimulate the proliferation of human keratinocytes by promoting the expression of cyclin D2 and inducing G1 to S phase progression in the cell cycle [48]. Moreover, estrogen inhibits the oxidative stress-induced apoptosis in keratinocytes by promoting expression of the anti-apoptotic protein Bcl-2 [49]. It can also induce direct DNA damage via its catechol metabolites [50] and HPV infection has shown to considerably increase the formation of these potentially carcinogenic estrogen metabolites [36]. Also, there is increasing evidence that estrogen has the property to influence the immune system by acting on the cytokine production [51]. Estradiol has been shown to inhibit the expression of GM-CSF in the U2OS cell line through its interaction with ERα and to decrease this production via contact with ERβ [52]

Progesterone has also been shown to act on cytokine production to affect the immune system [51]. It increases the production of IkB, an inhibitor of NF-kB [53] and has an inhibitory effect on GMCSF secretion [54]. The immunosuppression caused mainly by the increased progesterone, which is necessary for maintaining a fetus during pregnancy, further predisposes a woman to the acquisition and development of lesions induced by HPV [33, 55, 56]. Researchers in molecular biology have also found an interaction between progesterone and HPV. It is known now that HPV 16 encodes a protein located in the region of E 6 and E 7 reading frames that cooperates with activated ras oncogene to transform primary cells [57]. The LCR of HPV 16 is reported to contain a deoxyribonucleic acid sequence that enhances response to both progesterone and glucocorticoids thereby increasing E 6 and E 7 transcription [58]. E6 and E7 oncoproteins bind to p53 and Rb, respectively, and surpass the host defense system [59-61]. In pregnancy, the elevated progesterone level increases HPV gene expression, giving rise to larger numbers of viral copy and multiplication of virus-transformed cells [62]. During the first trimester, there is a low immune response to HPV, thus accounting for the higher frequency of persistence of the virus. This deficient response, however, undergoes an intense recovery at the beginning of the third trimester, with reinforcement during the postpartum period to eventually lead to regression of the infection [63].

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Furthermore, in cervical carcinogenesis, HPV DNA is often integrated into the host genome, leading to the loss of E2 gene. HPV E2 is a modulator of HPV gene expression and an inducer of apoptosis [64]. E2 and E7 proteins can induce apoptosis in transformed cells [65] and progesterone and estrogen increase the levels of E2 and E7-induced apoptosis [66]. However, with the loss of E2 in HPV infection, cell proliferation might increase [64]. Also, in the absence of E2, these hormones have been found to be a possible risk factor for cervical carcinogenesis by altering HPV gene expression [67]. Other authors speculated that the performance of multiple cervical biopsies in the antepartum evaluation could give the appearance of spontaneous regression [30]. Alternatively, other studies suggested a correlation between CIN course (cervical intraepithelial neoplasia) and mode of delivery and found a higher rate of regression of cervical dysplasia in association with vaginal delivery compared with cesarean section (67 versus 13 %) [30, 68]. A possible mechanism for this finding may be the loss of the dysplastic cervical epithelium during cervical ripening and the passage of the fetus through the birth canal [28, 69]. Other studies have not reported any differences in regression rates among patients who delivered vaginally or by cesarean section [26, 70], which is also the case in the present study.

Limitations of this study include

1. The limited number of cases.
2. The limited data on specific HPV subtypes have to be recognized as a limitation of the study.
3. Also, in the group of pregnant women we did not categorize the patients according to age. This can be a limitation as the females aged less than 24 years are known to be more often infected with HPV while at the same time they are known to clear the infection more spontaneously.
4. Inter-observer variability of TCT and HPV test results.

V. Conclusion

This study supports the fact that a conservative management of HPV infection in pregnancy is safe since it reports high regression rates and no progression after delivery. However, this mode of management of HPV infection during pregnancy is valid as long as an invasive disease is ruled out.

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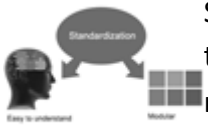

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Note :

"

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"

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3. Submission of Manuscripts,

4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

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