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RETT SYNDROME Mutation

A Study of Giant Ovarian Tumors

Highlights

Immediate Postpartum Insertion

Target against the Obesity Epidemic

Discovering Thoughts, Inventing Future

VOLUME 21 ISSUE 3 VERSION 1.0

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A Study of Giant Ovarian Tumors Presenting with Higher Incidence of Torsion: A Journey of my Experience in Covid-19 Pandemic at Tertiary Care Centre

By Dr. Rajshree Dayanand Katke

Abstract- *Objective:* The ovarian cases presenting to the gynecologyare not new. However, during the COVID -19 pandemic , a varied presentation was observed and hence demanded a study of such cases.

Methodology: A cross- sectional observational case study of 20 gynecology cases with ovarian tumors operated during the COVID-19 pandemic from October 2020 to March 2021 at Grant Government Medical College; Mumbai.

Results and Conclusion: The patients mainly presented with a chief complaint of abdominal distension; dyspepsia, and pain in the abdomen. Other presenting complaints included menstrual irregularities and menorrhagia, and difficulty in micturition. The age group studied comprised from 25 – 65 years of age. The patients belonged to upperand upper- middle socioeconomic class and were mainly from the high - income group. the patients presented from both urban and rural residential areas.

Keywords: *pandemic; torsion; COVID -19; huge ovarian tumor; gynecology; tumors.*

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Results and Conclusion: The patients mainly presented with a chief complaint of abdominal distension; dyspepsia, and pain in the abdomen. Other presenting complaints included menstrual irregularities and menorrhagia, and difficulty in micturition. The age group studied comprised from 25 – 65 years of age. The patients belonged to upperand upper-middle socioeconomic class and were mainly from the high - income group. the patients presented from both urban and rural residential areas. The ovarian tumors were giant, with sizes ranging from 30 x 35 centimeters to 20 x 25 centimeters. The tumors underwent torsion for more than five turns in most of the cases with onset of the gangrenous ovary in some cases; these cases were managed with great surgical expertise and precision and timely intervention to minimize the intraoperative and post-operative complications; The histopathological report included epithelial tumors like serous and mucinous cystadenomas and nonepithelialtumors like granulosa cell tumors and fibrosarcoma.

The management of such cases was challenging because of the effects of the COVID-19 pandemic and the results of lockdown. In the period of lockdown, the emergency health services were available but still because of fear or some other reasons, the patients have not turned up to the specialist doctors in spite of they were having dull aching pain and enlarged tumor. When they came to us; they were already having the torsion of the huge tumor.

Keywords: pandemic; torsion; COVID -19; huge ovarian tumor; gynecology; tumors.

I. Introduction

The first COVID 19 case was detected in Wuhan in December 2019, and COVID 19 was declared as a pandemic by WHO. COVID-19 is a disease caused by a new coronavirus called SARS-CoV-2. WHO first learned of this new virus on 31 December 2019, following a report of a cluster of cases of 'viral pneumonia' in Wuhan, People's Republic of China. (1). The effects of COVID 19 were profound calling for a Nationwide lockdown from 23 March 2020. This led to a disruption of essential health care facilities with only urgent/emergency health services being available for a quite a long time.

Criteria for Testing

i. A woman with respiratory illness with one of the following
ii. History of travel to abroad in the last 14 days
iii. Is a close contact of a laboratory proven positive patient
iv. She is a health care worker herself
v. Hospitalized with features of severe acute respiratory illness.

- In the reproductive period, non-inflammatory and inflammatory diseases of the lower genital tract, such as abnormal uterine bleeding and pelvic inflammatory disease, respectively, are common. Agynecologist's decision is fundamental in the definition of elective procedures that may be postponed depending on the general and clinical status of the patient and the availability of access to clinical treatment.

II. Materials and Methods

A cross sectional observational case study of 20 gynaecological cases operated during the COVID-19 pandemic from a period of October 2020 to March 2021 at Grant Government Medical College, Mumbai.

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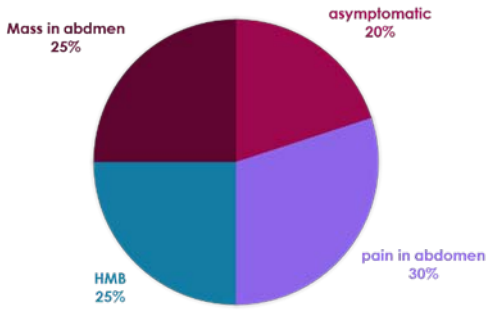
III. Results and Discussion

a) Distribution of cases as per age

Age in years	No of cases	percentage
15- 20 years	1	5%
21-30 years	1	5%
31-40 years	4	20%
41-50 years	10	50%
> 50 years	4	20%

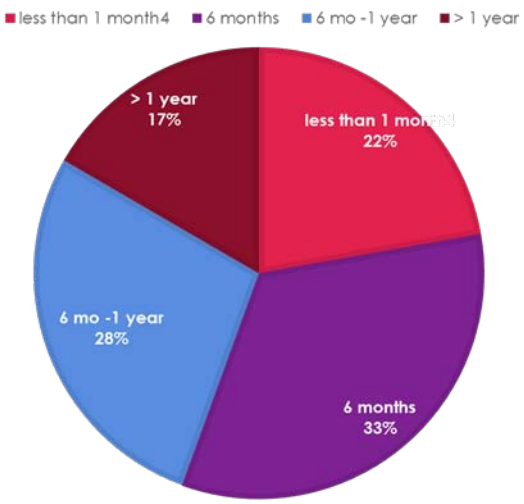
The most common age group presentation being between 41-50 years of age group that is almost half of the study group followed by women in the age group of 31 – 40 years and those in the age group of > 50 years.

b) Distribution of cases as per presenting symptoms



The most common complaint amongst the women who were symptomatic was b pain in abdomen in 30 % of the cases. Around 20 % of the cases were asymptomatic.

c) Distribution of cases as per Duration of presenting symptoms



Most of the cases had a history of onset of symptoms for more than 6 months, the cause of it can be attributed to the lockdown and the non availability of elective services.

- The patients mainly presented with a chief complaint of abdominal distension ,dyspepsia and pain in abdomen. Other presenting complaints included menstrual irregularities and menorrhagia and difficulty in micturition. The age group studied comprised from 25 – 65 years of age.

The patients belonged to upper and upper middle socioeconomic class and the patients presented from both urban and rural residential areas.

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The ovarian tumors were huge with size ranging from 30 x 35 centimeters to 20 x 25 centimeters.

The tumors underwent torsion for more than 5 turns In most of the cases with onset of gangrenous ovary in some cases, however were managed with great surgical expertise and precision and timely intervention so as to minimize the intra – operative and post-operative complications.

The histopathological report included epithelial tumors like serous and mucinous cystadenomas and non epithelialtumors like granulosa cell tumors and fibrothecoma were mainly from the high income group.

- The American College of Surgeons proposed stratification of surgical cases according to the patient's clinical condition and the severity of the disease as low, intermediate, or high severity.
- Emergency (<1h): Peritonitis by tubo-ovarian and/or pelvic abscess, necrotizing fasciitis in surgeries for pelvic and breast neoplasms;
- Urgent (<24h): Postoperative infections, acute inflammatory abdomen (adnexal torsion, myoma torsion, ovarian cysts), hemorrhagic conditions (ovarian cysts);
- Elective urgent (<2 weeks): Surgeries for neoplasms of the lower genital tract and breast previously diagnosed by pathological examination;
- Essential Elective (>2 to <3 months): Hysteroscopy for abnormal uterine bleeding (unknowledge causes, suspected malignancy, and menopausal transition), postmenopausal bleeding (suspected malignancy), cervical conization or looped electro excision procedure (to exclude neoplasm in the lower genital tract)
- Non-essential/elective surgery: Infertility procedures, family planning procedures (bilateral tubal ligation procedure).

The protocol followed at our tertiary care institute before operating the cases were as follow-

1) All elective patients should be admitted to Transit ward initially. Swabs should be sent for all patients from there.
2) After swab reports patients should be segregated into Covid/Non Covid Category.
3) Covid POSITIVE swab patients should be transferred to COVID facility/Centre (St. George's Hospital).
4) COVID NEGATIVE Swab patients should be transferred to respective unit wards.
5) Repeat swab should be sent for these patients from their respective wards 72 hrs. before proposed surgery.
6) All patients should have at least two consecutive negative swab reports, of which the latest swab should be within 72 hours of planned procedure.
7) All OT Healthcare workers, patients and visiting relatives should be screened before entering OT as per protocol. If found suspect/symptomatic, should not be permitted to OT, and should be sent to designated swab collection facility.
8) All OT Personnel should follow COVID sanitisation protocols on entry to OT with repeated handwashing, social distancing and adequate protective gear.
9) Visiting relatives of the patients should also have COVID Negative swab report prior to entry to OT/wards.

- Re-evaluate admitted patients for signs and symptoms of COVID-19
- Encourage Physical Distancing (maintaining distance of 6 feet)
- There should not be any adjoining inhabited buildings within 20 meters
- There should be separate changing rooms for male and female heath care workers with attached toilet and shower facilities
- Ideally, independent changing rooms with toilet and shower facility should be there for doctors, nurses and support staff
- There should be provision for opening the doors with feet or elbow without touching the handles
- Non elective surgeries postpone – at least 4 weeks

The ovarian cases presenting to the gynecology is not new.

However during the COVID-19 pandemic a varied presentation was observed and hence demanded a study of such cases.

Some of the selected cases are mentioned as follows-

CASE 1

A Case of 30 years old, married since 14 years Parity 3, Living 3, who presented with acute pain in abdomen. Her Ultrasound Abdomen + Pelvis was suggestive of heterogeneous to isoechoic solid lesion in left adnexa measuring 10.8 x 1.3 x 5.1 cm with ovarian vein engorgement & displacing the uterus inferiorly. cystic areas seen within suggestive of neoplastic lesion

On Examination, her general condition was fair, vitals normal, no pallor/edema/icterus, cardiovascular/ respiratory system – within normal limits. On per abdomen examination, a 10x 8 cm hard, firm mass felt, irregular margins, lower border palpated, restricted mobility, generalised tenderness and guarding was present. On per speculum examination, white discharge was seen, uterus not felt separately from mass.

Tumor markers weresent: CA125 – 7.25, CEA-2.38, rest tumor markers-WNL

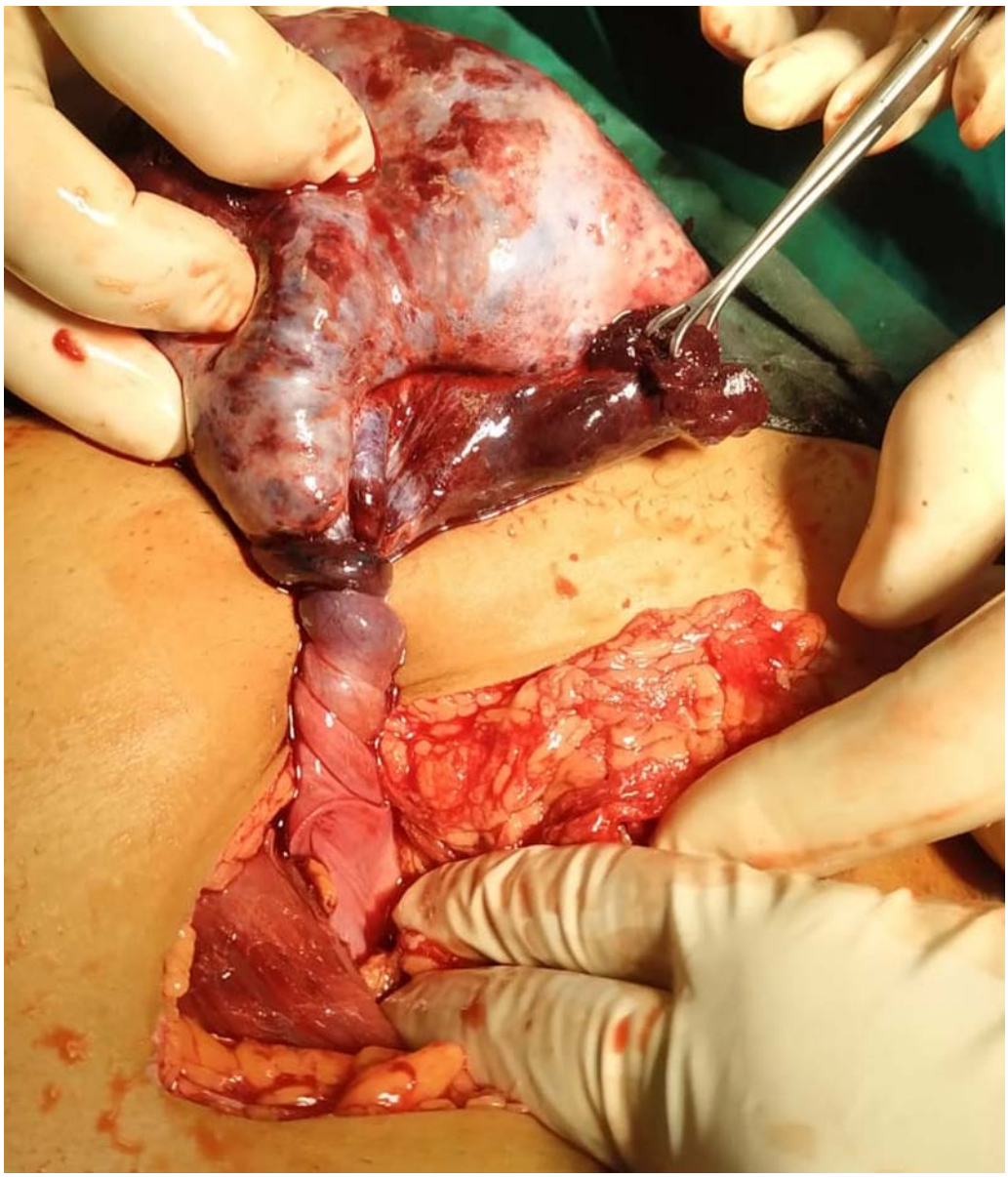
Contrast Enhanced Computed Tomography done on 11/2/2021 was suggestive of torsion of ovary along with part of fallopian tube.

On 13/2/2021, Patient was taken up for Emergency exploratory laparotomy done with ovarian

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mass excision. Frozen section was suggestive of germ cell tumor.

Histopathology was suggestive of mixed germ cell tumor (yolk sac tumor + dysgerminoma). Patient withstood the procedure well. Post operative monitoring done, followed by chemotherapy with Bleomycin + etoposide + Docetaxel.



CASE 2

A case of 37 years old, unmarried, nulligravida with right tubo-ovarian mass, with ventriculoperitoneal shunt, presented to outpatient department with pain abdomen, irregular menses.

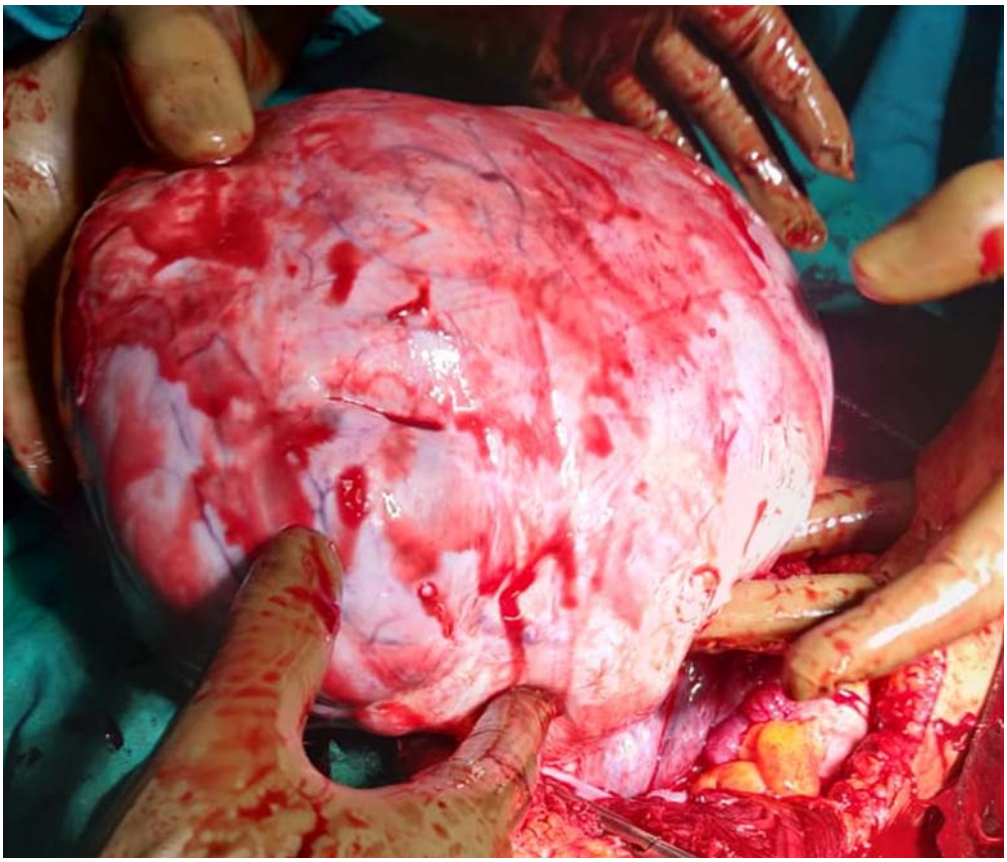
On Examination, her general condition - fair, vitals normal, no pallor/edema/icterus, cardiovascular/ respiratory system – within normal limits. On per abdomen examination, a mass of 30 weeks felt over abdomen, irregular margins present, firm to hard in consistency, immobile, local rise of temperature noted. ON Per rectal examination, firm, irregular mass felt

Her ultrasound Abdomen + Pelvis was suggestive of right ovarian mass of 14x 17 x 17 cm, in lower abdomen, and right adnexal region. The lesion shows spongiform pattern with multiple variable sized anechoic cyst interspersed with echogenic stroma, suggestive of right ovarian mass possibly neoplastic and right sided tubo-ovarian torsion.

Tumor markers- LDH – 1251 U/L, HCG – 1.5 MIU / ML, CA 125 – 233.3 U/ ML

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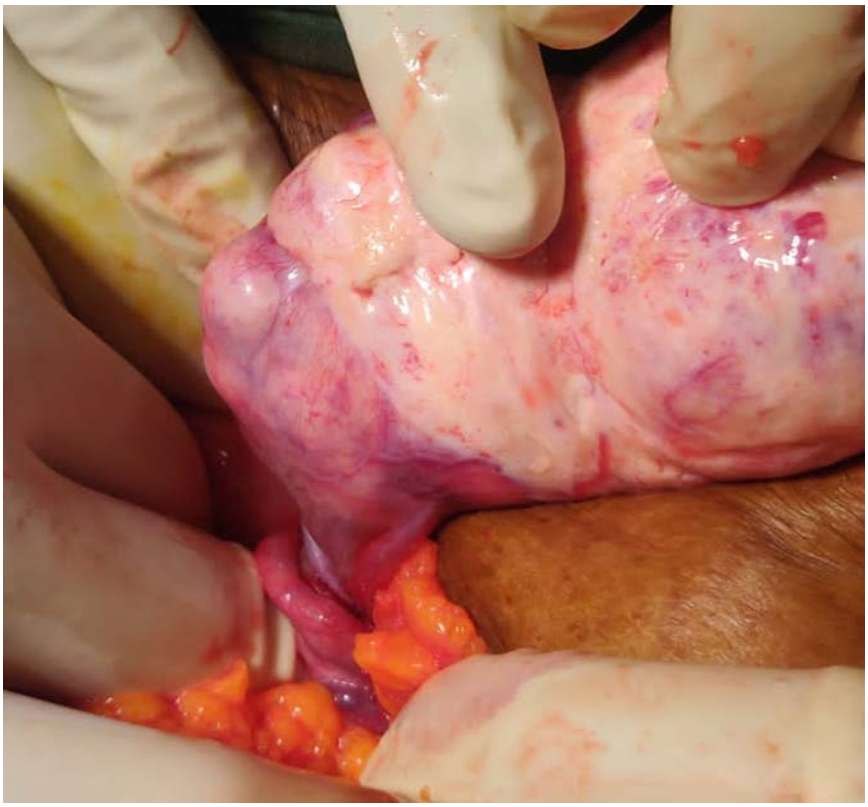
On 23/12/2020– patient underwent exploratory laparotomy with right ovarian mass excision. frozen sections was suggestive of granulosa cell tumor. Post operatively patient recovered well and discharged after suture removal. Histopathology report suggestive of granulosa cell tumor.

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CASE 3

A 60 yrsold, married since? years, parity 3, living 3, all normal deliveries, tubal ligation not done, post menopausal since 10-15 years, came with complaints of pain abdomen in right side.

On examination: general condition fair, vitally stable, no pallor/ edema/ icterus, cardiovascular/ respiratory system – within normal limits On Per abdomen – soft, minimal tenderness over right iliac fossa noted. On per speculum – cervix was pulled up, atrophied. Per vaginally a cystic mass felt in the right fornix, mobile, non tender,? uterus,? right adnexal mass, cervix pulled up, deviated to the left.





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Tumor markers- ca 125 – 10.2 u / ml, LDH- 325 U/L, CEA – 1.9, beta hcg – 5.4, AFP – 13.

On 10/3/2021- Patient underwent exploratory laparotomy with total abdominal hysterectomy with bilateral salphingectomy with bilateral oophorectomy. Pt withstood the procedure well. post operatively patient was well. Histopathological report- sex cord stromal tumor, fibrothecoma.

CASE 4

A 42 years old Parity 3, Living 3 with a huge mass in abdomen and pain in abdomen on and off since 1 year. on per abdomen examination a cystic mass of 10 x 15 cm in hypogastric region extending from umbilicus to lower abdomen, regular margins, mobility+, non tender. On per speculum examination, cervix was taken up. On per vaginum examination, a 22 weeks mass felt, cystic in consistency with mass covering the right iliac fossa, extending upto umbilicus, right fornix obliterated.

On 1/2/2021– Ultrasound (A+P) suggestive of 17 x 21 22 cms complex solid cystic lesion with septations, likely arising from ovary, likely malignant etiology.

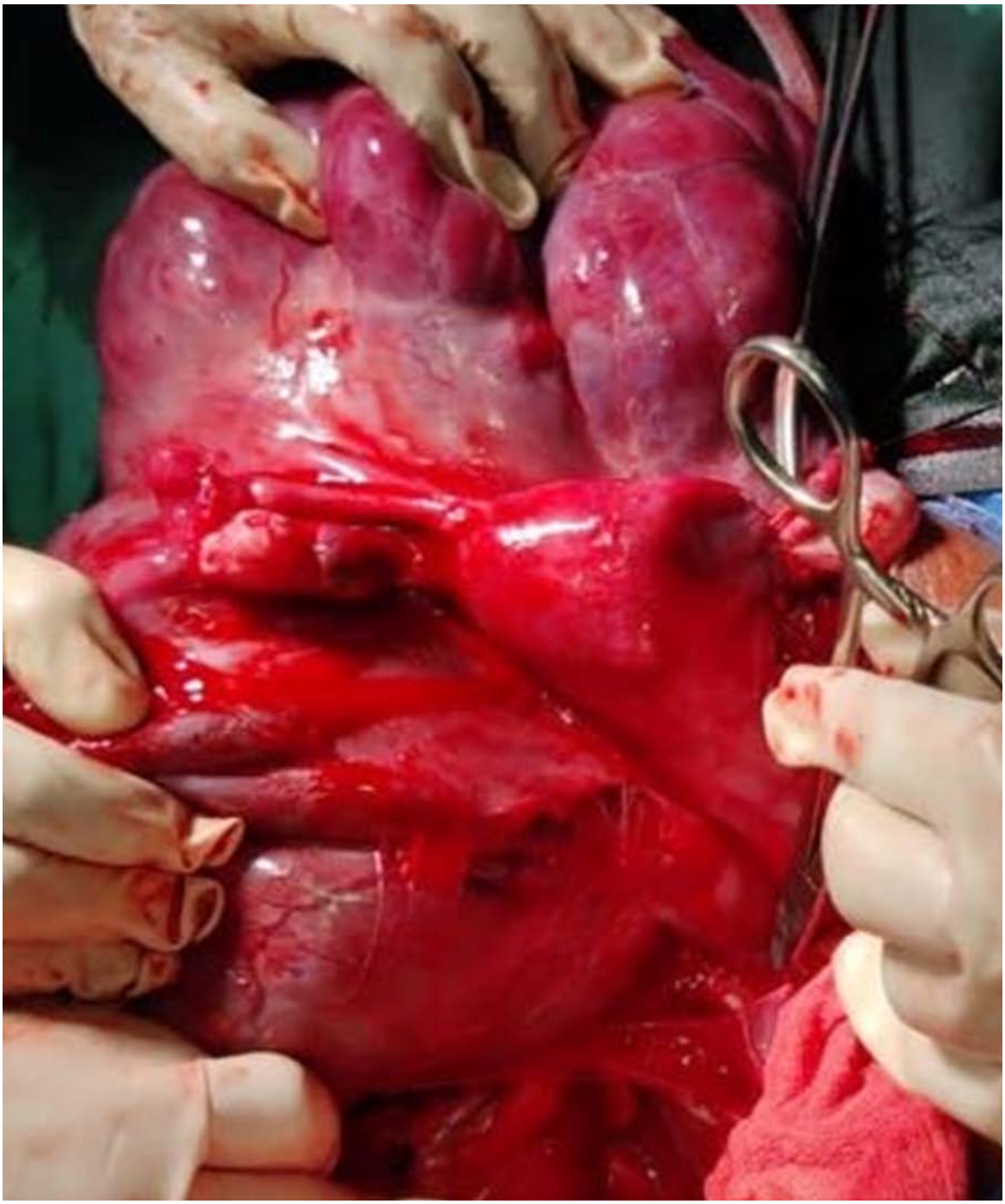
Tumor marker were sent, B hcg 0.1, CA19.9-2.6, CEA 1.1, AFP 1.37, CA 125-1

On 20/3/2021, exploratory laparotomy with retroperitoneal mass excision with Total Abdominal mass excision with B/L salpingo-oophorectomy. Histopathology report suggestive of Spindle cell tumor with differential diagnosis being-

1. Low grade Fiboromyxoid Sarcoma,
2. PEComa,
3. Lymphangioeliomyomatosis



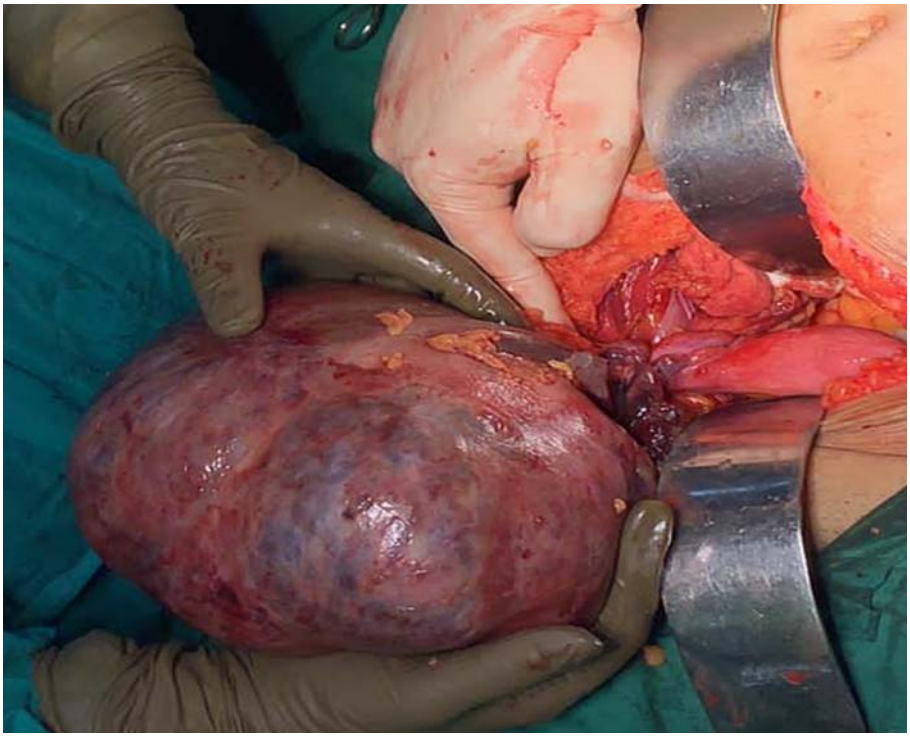
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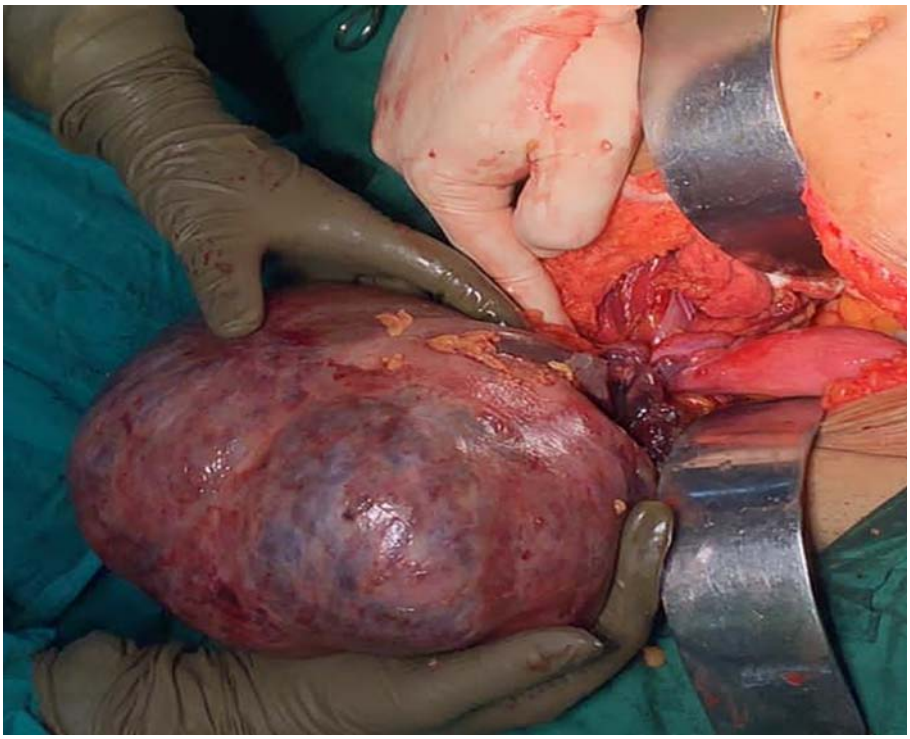


CASE 5

A 60 years. Parity 2, Living 2 came with complaint of pain in abdomen. On examination: general condition fair, vitally stable, no pallor/edema/icterus, cardiovascular/respiratory system – within normal limits On per abdomen examination a 24 weeks mass in hypogastrium, right iliac region, extending above umbilicus, regular margin, lower border felt, cystic in consistency, with restricted mobility felt. On per speculum examination, cervix pulled down and backwards. On per vaginum examination, uterus could not be felt separately.

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Ultrasound (Abdomen +Pelvis) suggestive of large multi loculated cystic pelvic mass, 13 x 15 x 18 cm, arising form pelvis, right adnexal or ovarian origin. Patient underwent exploratory laparotomy with Total Abdominal Hysterectomy with right ovarian mass excision with B/L salpingo-oophorectomy. Histopathology report suggested Haemorrhagic cyst– right ovarian mass

The unusual increased incidence of huge abdominal masses to our gynecological department raised a need to study the effects of lockdown. A similar effect of covid 19 pandemic leading to lockdown and inaccessibility of health facilities was studied that lead to a conclusion that although COVID-19 does not directly affect pregnancy outcomes, it has indirect adverse effects on maternal and child health. (2)

- These patients have had complaints like pain in abdomen for more than a year, however due to non availability of certain facilities like limitation of transport facility, cessation of elective surgical

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procedures, conversion of hospitals to COVID designated centres, led to a decreased accessibility of immediate medical help to these patients.

- As a result of which despite having symptoms they had a delay in the management of their cases. However administrative regulatory activities like lockdown were a need of hour in order to contain the rampant spread of the COVID -19 and reduce the morbidity and mortality associated with it.
- The epithelial and non epithelialtumors showed a greater incidence of torsion of adnexal mass with tumor thereby leading to gangrenous and necrotic changes and an acute abdomen.

In the modern era of medicine, such huge mucinous ovarian tumours have become rare in the current medical practice, as most of the cases are detected early during routine gynaecological examinations or on ultrasound. However this was not the case during lockdown. Conservative surgery as ovarian cystectomy and salpingo-oophorectomy is satisfactory for benign lesions.4 Frozen section is very significant to know the malignant variation of this tumour and that helps in the management of the patient. As in the huge tumours, the anatomical planes get distorted, so the surgical expertise is required to prevent the complications (3)

Management of ovarian tumors depends on the patients age, the size of the cyst and its histopathological nature for large ovarian masses with a risk of malignancy and hence a staging laparotomy and intraoperative frozen section has their importance.(4)

The ovarian tumors both benign as well as malignant can undergo torsion and have been reported in numerous studies. Patient can present with acute abdomen due to torsion. In a case presenting with acute abdomen with lump abdomen, ovarian mass with torsion should be considered as differential diagnosis. (5)

The disruption of services has resulted into health being affected in all ways including family planning services. It has been studied that there is a huge unmet need of contraception available. Hence a proper mitigation of family planning is of utmost demand, although restraining of COVID 19 pandemic is also important (6)

IV. Conclusion

Although the measures like lockdown have been imposed for the containment of the COVID 19 infection, the increased cases of torsion of adnexal masses was reported in my experience. With proper management protocols and with all universal safety precautions the cases were managed with a great surgical expertise. Non epithelial ovarian cancers mainly granulosa cell tumours have excellent prognosis. Sex cord stromal tumours with an indolent course have good short-term prognosis, but with a greater risk of relapse.

- More and more studies are needed to be devised to study their clinical presentations, course, prognosis and role of different adjuvant therapies. Such studies are required at an international level for increasing the disease free survival rates, reducing relapse rates and to decrease the morbidity and mortality associated with such rare ovarian cancers.
- The management of such cases was challenging because the effects of COVID pandemic and effect of lockdown that restricted the availability and easy accessibility of health services thereby increasing the incidence of torsion of ovarian tumors.

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Gestational Malaria and Factors Influencing Mosquito Bed Net use among Pregnant Women in Biyem-Assi, Yaounde

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Abstract- Malaria is an endemic parasitic disease in Cameroon and it is transmitted by the bite of the female Anopheles. Malaria prevention methods are diverse. Their availability sometimes does not guarantee effective usage and the use of each method in isolation may not provide the necessary results for the fight against malaria. Pregnant women are relatively more vulnerable and so it is recommended that they should be protected against malaria. Proper protection will require the use of mosquito bed nets as major malaria prevention method. This study was designed to find out malaria prevalence and factors influencing the use of mosquito bet nets among pregnant women of Biyem-Assi Health District. Information on the knowledge of malaria and use of malaria prevention methods, especially bed nets was collected from 302 pregnant women attending prenatal clinics in health institutions within the Biyem-Assi Health District of Yaounde VI subdivision using a pretested questionnaire.

Keywords: *malaria, pregnant women, mosquito bed net, Biyem-Assi Health District.*

GJMR-E Classification: *NLMC Code: WQ 240*



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Gestational Malaria and Factors Influencing Mosquito Bed Net use among Pregnant Women in Biyem-Assi, Yaounde

Judith Lum Ndamukong-Nyanga [α], Tchanga Chanceline Flore [σ], Ngo Batandi Helen Virginie [ρ] & Fegue Celestine [ω]

Abstract- Malaria is an endemic parasitic disease in Cameroon and it is transmitted by the bite of the female *Anopheles*. Malaria prevention methods are diverse. Their availability sometimes does not guarantee effective usage and the use of each method in isolation may not provide the necessary results for the fight against malaria. Pregnant women are relatively more vulnerable and so it is recommended that they should be protected against malaria. Proper protection will require the use of mosquito bed nets as major malaria prevention method. This study was designed to find out malaria prevalence and factors influencing the use of mosquito bet nets among pregnant women of Biyem-Assi Health District. Information on the knowledge of malaria and use of malaria prevention methods, especially bed nets was collected from 302 pregnant women attending prenatal clinics in health institutions within the Biyem-Assi Health District of Yaounde VI subdivision using a pretested questionnaire. Thick smear was prepared for screening *Plasmodium* parasites. Analysis was done using EPI INFO version 16 (Chicago IL USA) and test of *Chi 2*. The study revealed that malaria prevalence was 48.5%. The shape of mosquito net had a significant (P = 0.05) effect on its use and a reduction on prevalence of malaria. The use of mosquito bed net was 47.7% while some of the women (52.3%) did not use it. Profession significantly influenced (P < 0.04) the use of mosquito bed nets. Some of the women did not use mosquito bed nets for different reasons such as heat, forgetfulness, neglect, dislike, etc. The shape and color influenced the use, but this was not significant. Use of mosquito bed nets as major malaria prevention methods is not considered as priority by pregnant women. Sensitization campaigns by government and NGOs should reduce malaria prevalence during pregnancy and give a priority position to mosquito bed nets.

Keywords: malaria, pregnant women, mosquito bed net, Biyem-Assi Health District.

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I. Introduction

Malaria is a fatal disease caused by parasites transmitted to humans through the bites of infected female *Anopheles* mosquitoes [1]. Its major impact is almost entirely on developing countries, especially in Africa [2]. More than 85% of malaria cases and 90% of malaria deaths occur in Sub-Saharan Africa and mostly during the rainy season [3].

In Africa, there are several risk factors for this disease. These factors are related to the existence of the vector that promotes the transmission of the parasite, in addition to the hot climate and low socio-economic conditions that have an impact on the control of the disease [4]. Vulnerable individuals include children under 5 years of age; unimmunized pregnant women, in whom malaria often leads to miscarriages, maternal deaths, low birth weight, abortions, stillbirths, and maternal anemia due to blood loss [5, 6,7]; immunocompromised individuals; and international travelers from malaria-free areas. Pregnant women are more vulnerable because their immunity has been diminished by pregnancy [8].

In Cameroon, malaria remains the major endemic disease and one of the leading causes of morbidity and mortality in the most vulnerable groups [9]. According to the Cameroonian Ministry of Public Health, the disease accounts for 40 to 50 percent of the reasons for medical consultations, is responsible for 41 percent of deaths among children under five years of age, 18 percent of deaths in hospital facilities, and consumes about 40 percent of the annual household health budget [10]. The high morbidity and mortality rates can be explained by the insalubrity of the environment, anarchic constructions, ignorance by the population of prevention methods, low participation in control activities, lack of individual protection against mosquitoes, and the increasing resistance of plasmodium to usual antimalarial drugs [11]. With a view to reducing the spread of this disease, the efforts undertaken at the international level are relayed at the national level by a strong commitment of the State. Thus, through the Growth and Employment Strategy Paper (DSCE), the Cameroonian government has clearly stated the objective of reducing the death rate

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associated with malaria to less than 10% by 2035 [12]. Thus, many measures have been taken, including free treatment and treatment of malaria.

Thus, many measures have been taken, including the free treatment of children under 5 years old suffering from uncomplicated malaria by all health facilities and the free distribution of several million long-lasting insecticidal nets (LLINs) [13,14].

There is a gap between the acquisition of LLINs and their use as well as adherence to their use in families with pregnant women and children. Universal coverage of LLINs remains a major challenge in malaria prevention in Cameroon. For this study, the following specific objectives were developed : 1. To determine the prevalence of gestational malaria taking into account the socio-demographic characteristics of the participants in Biyem-Assi; 2. To determine the effect of bednet use on *Plasmodium* infection in pregnant women in Biyem-Assi; 3. To determine the factors influencing bednet selection and use by pregnant women in Biyem-Assi.

II. Materials and Methods

a) Study Site

Yaoundé, the capital of Cameroon and capital of the Central Province is located 300 km from the Atlantic coast. It is surrounded by 7 hills, the highest of which are located on the West and North-West sides. Yaounde had an area of 13614 ha in 2002 and a population of about 2 million inhabitants in 2006. Its geographical boundaries are: to the west, the District of Mbankomo; to the east, the Division of Mefou-Afamba; to the south, the Division of Mefou-Akono; and to the north, the District of Okola [15]. The climate in the city of Yaounde is equatorial, characterized by the alternation of two dry seasons and two rainy seasons. The average temperature is 23.5°C (with a range of 16°C and 31°C depending on the season), and rainfall is 1650 mm of water per year. The average air humidity is 80% and varies during the day between 35 and 98%. Frequent winds (humid) blow in a south-westerly direction; strong winds are oriented towards the north-west. The vegetation is of the intertropical type with predominance of southern humid forest [15].

b) Target population, Data and Sample Collection

The study population consisted solely of pregnant women receiving prenatal care (ANC) and who had voluntarily approved and signed the informed consent form. The criteria for non-inclusion were refusal to participate and failure to sign the informed consent form.

The sample size was calculated according to Lorentz's formula as follows:

$$N = (Z^2 \times P \times Q)/d2$$

where
Z is the statistical power (1.96);
P is the estimated prevalence of disease; 23% based on Tonga et al. 2013 [16];
Q=1-P;
d represents the level of significance (0.05).
Substituting into the formula gives N = 272 pregnant women.

To maximize sample collection and reliability of results, 350 women where issued consent forms and 302 gave consent and where enrolled in the study. Sample collection was carried out from July 25 to August 17, 2018.

c) Questionnaire

A pre-tested and validated questionnaire aimed at obtaining information on anthropometric, obstetric, environmental parameters and socio-demographic characteristics was given to each pregnant woman enrolled in the maternity ward. The information obtained was then recorded in a notebook, with a code assigned to each participant.

i. Collection of blood samples

The participant's code as well as the date was written directly on the slide. The finger was sanitized with an alcohol swab by massaging to stimulate blood circulation With a sterile lancet, the tip of the finger was pricked. By gently pressing the finger, two drops of blood were collected on the blade to be used for the thick film. The blood remaining on the finger was wiped off with absorbent cotton. With the corner of the second slide, the thick drop was made by bringing the two drops of blood together and spreading them in circular motion to form a uniform thick layer. The slides were air dried, stored in a slide box ready for staining.

d) Staining of thick film

Giemsa's dye was prepared from the stock solution. It was diluted at 1:20 (1 volume of Giemsa stock solution for 19 volumes of distilled water) and the mixture filtered through Whatman paper. The Giemsa was delicately poured into the staining trough until the slides were completely immersed. The slides were left to stain for 20 minutes. They were rinsed under running water. The slides were arranged to drain at an angle on a slide stand for 15 minutes for air drying.

i. Observation of slides

The slides were observed with the 100X objective (immersion objective) of the Light Microscope.

The thick film was used for the detection and quantification of trophozoites. The parasites were counted against 200 leukocytes and the Parasitemia (parasites/μL of blood) was calculated by considering an average of white blood cells at 8000/μL of blood for each individual according to the following formula:

$$\text{Parasitémie} = \frac{\text{Number of parasites counted} \times 8000}{\text{Number of leukocytes (200)}}$$

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Parasitaemia was considered low for parasite value < 500 / µl blood, moderate for values between 501 - 5000 parasites / µl blood and high for parasite value > 5000 / µl blood [17].

e) Statistical analysis

The data was entered into a work sheet using Microsoft® Excel 2010 and then analyzed using Epi Info™ 7 (CDC, Atlanta). The association between bed net use as a preventive measure and socio-demographic factors was analyzed using the Chi-2 test. Frequencies were calculated and presented in tables and charts. The results were significant for a probability value $P < 0.05$.

f) Administrative and ethical considerations

Authorization was obtained at the University of Yaounde 1, signed by the Director of the school, the Head of Department of Biological Sciences and the Research Supervisor. Authorization and clearances were also obtained from the Ministry of Public Health Cameroon through the Directorate of the District Hospital of Biyem-Assi and through the Rector of the University of Yaounde I. An informed consent form was read and signed by the pregnant women. The information collected was treated confidentially. Only the members of the research team and the health personnel in charge of the follow-up of these women had access to it. Women carrying parasites were taken care of by the health care team at the health facility, in accordance with the recommendations of the dedicated control programs.

III. Results and Discussion

a) Results

i. *Characteristics of the study population*

A total of 302 pregnant women were enrolled in this study. The participants included in this study were predominantly Christian (295). They ranged in age from 17 to 53 with an average age of 25 ± 6 years. The majority of participants were students (89, 30.27%), single (169, 56.52%), and had a university education (147, 48.84%) (Table 1).

Tableau 1: Demographic characteristics of the study population

Characteristic	Categories	Effective	Frequency
Religion	Christians	295	98,32 %
	Muslims	5	1,68 %
Age (years)	<25	101	34,24 %
	25-34	161	54,57 %
	≥35	33	11,19 %
Marital status	Married	130	43,48 %
	Single	169	56,52 %
Profession	Pupil/Student	89	30,27 %
	housewives	55	18,71 %
	Workers in the formal sector	74	25,85 %
	Workers in the informal sector	76	25,17 %
Educational level	≤Primary	20	6,64 %
	Secondary	134	44,52 %
	University	147	48,84 %

ii. *Participants' Knowledge on malaria transmission, signs and symptoms, consequences in mother and society*

The participants in this study generally had a good knowledge of malaria. Indeed, the majority had knowledge about transmission (94.79%), signs and symptoms (92.31%), consequences in children under 5 years of age (83.84%), knowledge on consequences of malaria in pregnant women (90.35%), dangers of malaria to society (88.10%), and preventive measures against malaria (97.93%) (Table 2).

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Tableau 2: Knowledge on malaria transmission, consequences and prevention

Characteristic	Categories	Number of people	Prévalence (%)
Knowledge on mode of transmission	Oui	273	94,79
	Non	15	5,21
Recognition of signs and symptoms	Oui	252	92,31
	Non	21	7,69
Knowledge on the consequences of malaria in children from 0- 5 years	Oui	166	83,84
	Non	32	16,16
Knowledge on the consequences of malaria in pregnant women	Oui	206	90,35
	Non	22	9,65
Knowledge on the dangers of malaria to society	Oui	222	88,10
	Non	30	11,90
Knowledge on the prevention and control of malaria	Oui	284	97,93
	Non	6	2,07

iii. *Participants' perceptions of the net as a preventive measure against malaria*

For the participants' perceptions of the net, this study revealed that 22.33%, 33%, and 46.67% of participants rated the net (as a preventive measure against malaria) as excellent, very good, and good, respectively (Fig. 1).

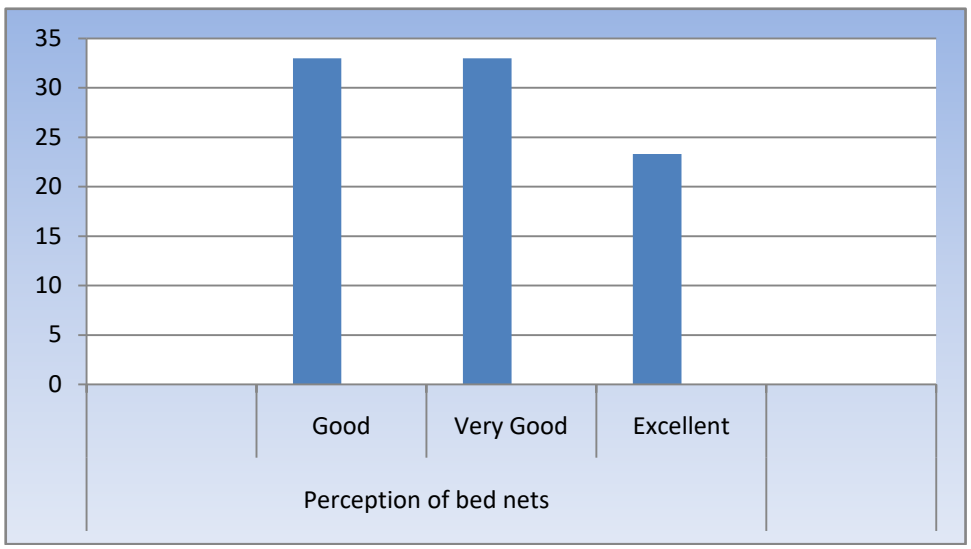


Figure 1: Participants' opinions about the mosquito bednet

iv. *Malaria prevalence among pregnant women*

There was a high prevalence of gestational malaria found in the study population (48.5%). Women aged 25-34 years (48.45%), primiparous women (49.55%), those with a low level of education (60%), living in a poorly sanitized environment (presence of puddles, water and bushes: 50.35%) and being in their first trimester of pregnancy (58.49%) were the most affected by Plasmodium. The same was true for those living in wooden houses (50%). Regular use of the net decreased the prevalence of malaria among the pregnant women in this study although this difference was not significant (Table 3).

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Table 3: Prevalence of gestational malaria in relation to socio-demographic characteristics.

Characteristic	Categories	No. Sampled	No. Infected	Prevalence (%)	χ^2	P-valeur
Age (Years)	<25	101	49	48,51	1,23	0,74
	25-34	161	78	48,45		
	≥35	33	16	48,48		
Parity	Primiparous	111	55	49,55	0,05	0,81
	Multiparous	169	80	40,70		
Age of pregnancy	Trimester 1	53	31	58,49	4,46	0,10
	Trimester 2	126	53	42,06		
	Trimester 3	120	61	50,83		
Profession	Students	89	43	48,31	0,14	0,98
	Housewives	55	27	49,09		
	Formal workers	74	35	47,30		
	Informal workers	76	35	46,05		
Level of education	≤Primary	20	12	60,00	1,61	0,44
	Secondary	134	61	45,52		
	University	147	73	49,66		
Type of house	Wooden	8	4	50,00	0,004	0,94
	Block	289	141	48,79		
Presence of bushes and flowers around houses	Yes	143	72	50,35	0,15	0,69
	No	154	73	47,40		

χ^2 : Chi Square P-valeur: level of significance

v. *Mosquito bed net Ownership among pregnant women*

Bed net ownership was influenced by the socio-demographic characteristics of the participants in this study. Bed net ownership was high among pregnant women aged 25-34 years (147, 48.7%), multiparous women (157, 52,0%), University students (84, 27,8%), and women with a higher levels of education (135, 44,7%) (Fig. 2).

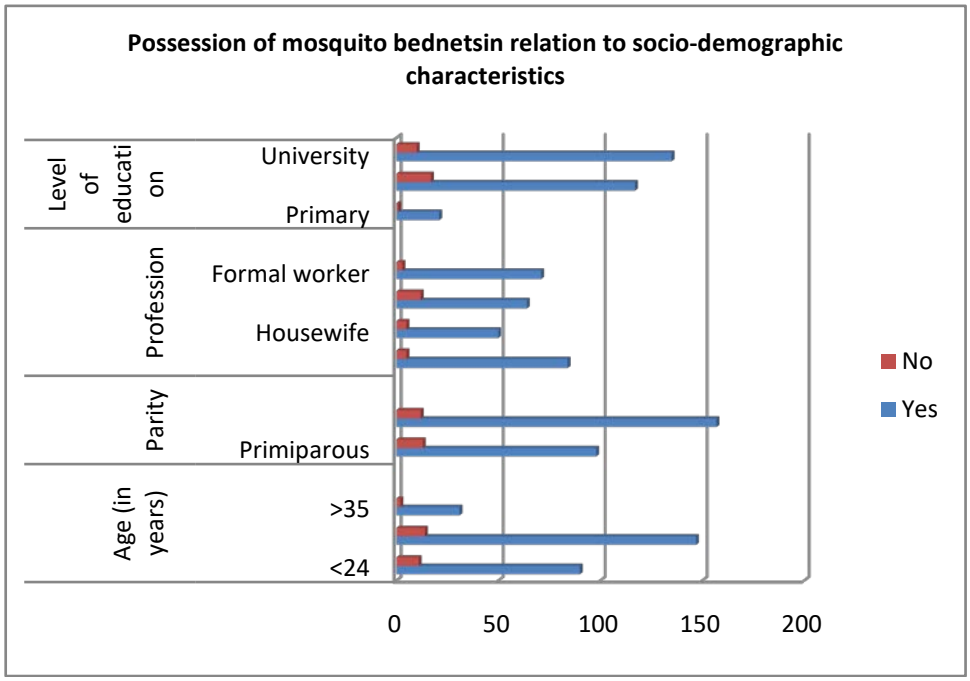


Figure 2: Net ownership as a function of participants' socio-demographic characteristics

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Participants' employment status significantly (P=0.04) influenced bed net ownership. Thus, students/pupils had high net ownership with a percentage of 31.23% compared to the formal/informal workers and housewives (26.39%, 23.79% and 18.59%, respectively) (Fig. 3).

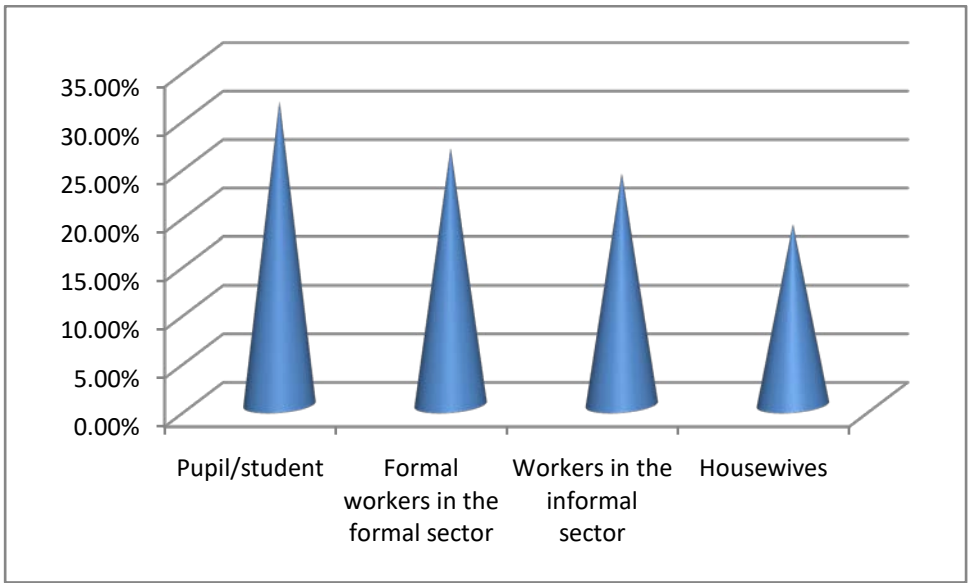


Figure 3: Bed Net Possession in relation to Participant's Occupation.

vi. *Effect of mosquito bed net use on Plasmodium infection in pregnant women*

Participants who used the net had a Plasmodium infection rate of 53.49% (Table 4). Those using the rectangular shape were heavily infested with a prevalence of 50.37% compared to pregnant women using the white color (46.20%). The shape of the net significantly (P=0.05) influenced Plasmodium infection among participants (Table 4).

Table 4: Effect of net use on Plasmodium infection among participants.

Characteristic	Category	Effectif No.sampled	No. Infected	Prevalence (%)	χ^2	P-valeur
Utilisation of mosquito bed nets	Yes	258	123	53,49	0,29	0,58
	No	43	23	47,67		
Form of the mosquito net	Conical	9	2	22,22	1,74	0,05$
	Rectangular	268	135	50,37		
Coulour of the mosquito bed net	White	171	79	46,20	3,13	0,21
	Blue	21	14	66,67		
	Greeen	2	1	50,00		

χ^2 *: Chi Square* *P-valeur : level of significance*

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vii. *Facttors influencing the choice and utilisation of mosquito bed nets*

The overall use of the net by pregnant women who participated in this study was 53%. (Figure 4).

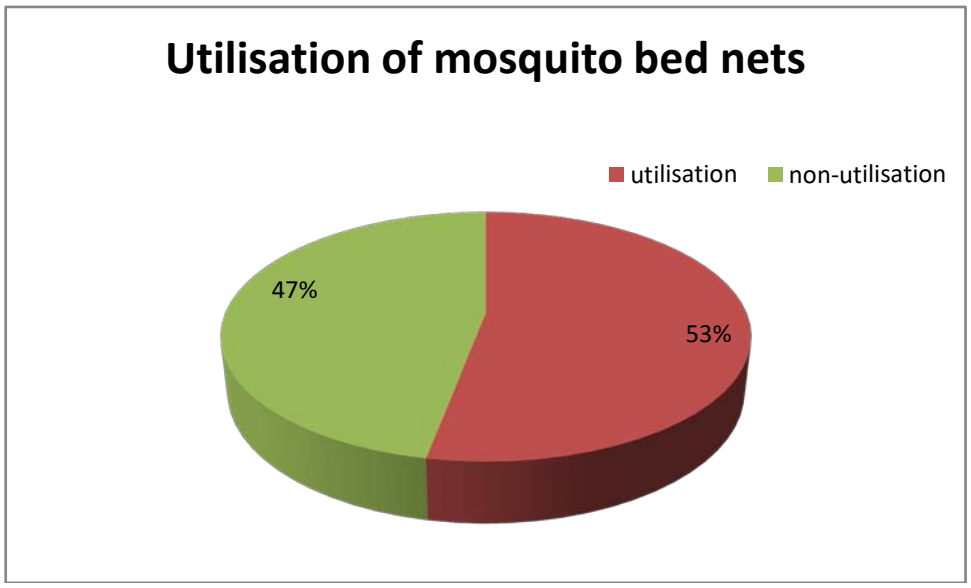


Figure 4: Utilisation of mosquito bed nets by the pregnant women

The choice of net was influenced by several factors. Pregnant women chose the net because it was spacious (39,74%), easy to install (41,72%), and comfortable and beautiful (18,52%) (Table 5).

Tableau 5: Factors influencing the choice of mosquito bed nets by participants

Factor	Number sampled	Prevalence (%)	χ^2	P-valeur
Spacious	120	39,74	4,46	0,18
Easy to install	126	41,72	0,06	
Beautiful and comfortable	56	18,54	1,11	
Total	302	100		

Several socio-economic factors of participants influenced net use, although this was not significant. Christian women, unmarried women, students, university students, and women aged 25-34 years had a higher rates of net use than their counterparts (Table 6).

Table 6: Association between Socio-demographic factors and mosquito bed-net utilisation

Characteristic	Categories	Number Sampled	Prevalence (%)	χ^2	P-valeur
Age	<25	83	32,81	1,96	0,37
	25-34	140	55,34		
	≥35	30	11,86		
Marital status	Célibataire	143	55,89	0,15	0,29
	Mariée	113	44,14		
Religion	Chrétienne	252	98,83	0,99	0,08
	Musulmane	5	1,18		
Profession	Elève-Etudiante	75	29,53	1,34	0,71
	Ménagère	50	19,69		
	Formel	64	25,20		
	Informel	65	25,59		

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Level of education	≤Primaire	18	6,98	0,56	0,75
	Secondaire	113	43,80		
	Universitaire	127	49,22		

IV. Discussion

Malaria in pregnancy is a major public health problem in sub-Saharan Africa. It poses a risk to both the mother and the fetus because it has a compromising effect on immunity in the latter [18]. Despite the poor implementation of malaria prevention strategies, their use has a reasonable effect on malaria and pregnancy parameters. Thus, gestational malaria is still a threat in our country. This study revealed a good knowledge of pregnant women on the causes and complications of malaria and the benefit of using preventive means such as the impregnated mosquito net, however the rate of net use was low.

The prevalence of gestational malaria has been reported throughout Africa and particularly in Cameroon [16,19]. The overall prevalence of gestational malaria is 48.5% in this study. This is higher compared to the 39.2% reported in the Mount Cameroon area. This may be due to poor compliance with malaria preventive methods; specifically the low use of the mosquito net which was 47.97% in the study conducted in Mount Cameroon [20]. This prevalence is very high compared to the 7.90% and 6.60% found among pregnant women living in rural [21] and urban [22] areas of Cameroon respectively. This result may be explained by the different study areas, the type of study or the use of Intermittent Preventive Treatment with Sulphadoxine-Pyrimethanin (IPT-SP). In rural areas, a prospective longitudinal study was conducted with a predominance of multiparous women in the study population.

The prevalence of malaria is higher in younger pregnant women although this is not significant. This has been similarly proven by previous studies conducted in the Littoral [16] and in South West Cameroon [19]. This is because this group of pregnant women have not yet acquired specific pregnancy-related immunity that protects them from gestational malaria. This provides a better understanding of their susceptibility to Plasmodium falciparum. Consistent with previous studies, a poorly sanitized environment would influence the risk of malaria infection [19, 23]. These authors report that proximity to fields and/or puddles increased the occurrence of malaria in pregnant women living in such environments.

Radio, television, and health centers were the main sources of information for the vast majority of participants in this study about malaria and its dangers. The majority of nets were obtained during prenatal visits. This finding is consistent with that conducted in Buea [24] where the primary source of nets for pregnant women had been ANC. The most recurrent shapes and colors were rectangular shapes and white colors, respectively.

Occupation significantly influenced (P=0.04) net ownership in the study population. This result is in agreement with that of Dionne-Odom reported in Cameroon. In addition, the net use rate was 47.67%. This rate is high compared to the 16.9%, 26%, and 17% observed in Cameroon [25,26], Nigeria [27] and Sub-Saharan Africa [28], respectively. A plausible explanation for this high net use could be the free net distribution campaigns by Cameroon's Ministry of Public Health (MINSANTE). In addition, the messages regularly disseminated through the various media channels always by this ministry on the use of the impregnated net as an effective means of malaria control have largely reached the populations. This is why the majority of our participants had heard about the net on television and radio. However, this rate of net use is low compared to that obtained in Buea (69.7%). Government action in easy accessibility justifies this proportion [24].

The shape of the net significantly influenced Plasmodium infection. The rectangular shape was the most used by participants in this study (268) for a malaria prevalence of 98.54% compared to 1.46% of infected participants using a conical shape net. This is because it is more spacious and fits the bed better. However, some participants preferred the conical shape because it was easier to install.

Given the high prevalence of malaria, net use is insufficient to significantly reduce malaria in this study population.

Cultural beliefs or prejudices are often cited as potential barriers to the adoption of innovative health behaviors and attitudes in Africa [29].. However, the results obtained in Cameroon indicate that, contrary to this idea, cultural beliefs are not the real explanatory factors for non-use of LLINs. This result is in agreement with those obtained in Niger [30]. However, education level is associated with net use. Women with at least secondary education had a high rate of net use. This result is due to the fact that those who have attained at least secondary school level are better able to read and understand messages on leaflets, radio, television. Thus, education remains an effective platform for influencing the behavior of pregnant women to reduce malaria prevalence.

In addition, net use by participants was significantly reduced by personal reasons such as heat, choking, burning, itching, and laziness to use the net. These findings corroborate those of previous studies conducted in North Cameroon [31] and Ghana [32],

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respectively, which reveals heat and choking sensation as reasons preventing net use by participants.

V. Conclusion and Recomendations

a) Conclusion

This study revealed a high prevalence of parasitic infections (48.5%) in the study population. Although not significant, the use of the net decreased the prevalence of malaria. However, the shape of the net significantly influenced Plasmodium falciparum infection. Color and reasons such as heat, discomfort, suffocation, itching, fatigue, and odor influenced net use by pregnant women in the study. The color of choice for participants was white. Therefore, the shape and color of the net should be taken into account during distribution campaigns, as it affects not only the choice but also the use of the net. Awareness campaigns by the government and medical services would prioritize net use and significantly reduce the prevalence of the parasite malaria in this area.

b) Recomendations

In order to reduce morbidity and even death related to this parasitic disease, namely malaria, it would be wise for pregnant women to systematically sleep under a long-lasting impregnated mosquito net, despite the personal considerations and difficulties they have with regard to the latter.

Governments could adopt effective methods for reducing malaria prevalence such as Intensification of information, education and communication campaigns on malaria and its dangers among pregnant women.

In order to improve the use of impregnated mosquito nets, health officials should strengthen free distribution at health centers.

There is the need to increase awareness about the correct and regular use of the treated net;

The production of conical nets could be reduced to rectangular shapes and the white color could be the most predominant because it is the preference of pregnant women.

Author's contribution: JLNN Designed the work, participated in data collection, wrote and edited the manuscript, NBHV participated in data collection, data analysis and wrote the draft of the manuscript, TCF and FC contributed in data collection

Declaration: All authors declare that there is no conflict of interest

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Immediate Postpartum Insertion of Intrauterine Contraceptive Device after Vaginal Delivery: It's Safety, Efficacy and Expulsion

By Heena Kaurani, Suhail Iqbal & Nidhi Golecha

Abstract- *Background:* India is the second most populated country in the world with 1.32 billion people. It contributes 17.5% of the world's population by adding 25 million births annually. Family planning with adequate spacing between the pregnancies can prevent about 32% of maternal deaths and 10% of child mortality. Postpartum period is the ideal time for family planning. Pregnancies with less than the recommended spacing can lead to obstetric complications like spontaneous abortion, preterm labour, postpartum haemorrhage and maternal mortality and fetal complications like SGA babies and fetal deaths. Hence practice of contraception is mandatory. Among the options available, Cu T 380A is the most cost effective, safe, rapidly reversible, long acting, coital independent method of contraception with relatively few side effects.

Aims and Objectives: To evaluate the safety, efficacy and expulsion rate of immediate postpartum intrauterine contraceptive devices (PPIUCD).

Keywords: *postpartum intrauterine contraceptive device (PPIUCD), contraception, expulsion.*

GJMR-E Classification: *NLMC Code: WP 640*



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Immediate Postpartum Insertion of Intrauterine Contraceptive Device after Vaginal Delivery: It's Safety, Efficacy and Expulsion

Heena Kaurani [α], Suhail Iqbal [σ] & Nidhi Golecha [ρ]

Abstract- Background: India is the second most populated country in the world with 1.32 billion people. It contributes 17.5% of the world's population by adding 25 million births annually. Family planning with adequate spacing between the pregnancies can prevent about 32% of maternal deaths and 10% of child mortality. Postpartum period is the ideal time for family planning. Pregnancies with less than the recommended spacing can lead to obstetric complications like spontaneous abortion, preterm labour, postpartum haemorrhage and maternal mortality and fetal complications like SGA babies and fetal deaths. Hence practice of contraception is mandatory. Among the options available, Cu T 380A is the most cost effective, safe, rapidly reversible, long acting, coital independent method of contraception with relatively few side effects.

Aims and Objectives: To evaluate the safety, efficacy and expulsion rate of immediate postpartum intrauterine contraceptive devices (PPIUCD).

Materials and Methods: This is a prospective observational study to assess the safety and efficacy of PPIUCD use in women inserted immediately (within 48 hours) after vaginal delivery. The study was conducted at Department of Obstetrics & Gynecology, Jhalawar Medical College, Jhalawar over a period of one year from November 2018 to October 2019. Ethical approval for the study was obtained from hospital ethical committee prior to the commencement of the study. 203 women delivering in the hospital fulfilling the inclusion criteria were included in the study. Postpartum insertion of IUCD Cu T 380A was done under sterile conditions and antibiotic coverage to ensure asepsis in the mother. Informed written consent was taken from mother before insertion after elaborating the possible complaints following insertion and reassurance.

Result: In this study, acceptance of PPIUCD was more in educated and multipara women with having at least one male child. The gross cumulative removal, expulsion and continuation rates were 7.9%, 12.8% and 68.9%.There was one case of pregnancy with IUCD in situ and no cases of perforation or other major complications were noted.

Conclusion: PPIUCD is a safe because there were only few complications and no case of perforation. It is also effective because there was only one case of IUCD failure which results in pregnancy. Although the expulsion rates are high, it provides an effective contraception in countries with limited access to health care personnel.

Keywords: postpartum intrauterine contraceptive device (PPIUCD), contraception, expulsion.

I. Introduction

India is the second most populated country in the world with 1.32 billion people. It contributes 17.5% of the world's population by adding 25 million births annually. Family planning with adequate spacing between the pregnancies can prevent about 32% of maternal deaths and 10% of child mortality.[1]Postpartum period is the ideal time for family planning. Pregnancies with less than the recommended spacing can lead to obstetric complications like spontaneous abortion, preterm labour, postpartum haemorrhage and maternal mortality and fetal complications like SGA babies and fetal deaths.[2-8.] Hence practice of contraception is mandatory. In countries like India, the only time a healthy woman contacts a health care provider is during delivery. With the increased number of institutional deliveries, due to provision of Janani Suraksha Yojana- a cash transfer scheme there is increased access to the pregnant women for promoting family planning services. In the immediate postpartum period, the insertion of intrauterine device is convenient and these women are highly motivated. The postpartum IUCD insertion is particularly suitable for our country where even para medical personnel can insert the Cu T and delivery is the only time these patients come in contact with the hospital. The intra uterine device is highly effective, safe, long acting, coitus independent and cost effective [9]method of contraception with relatively few side effects and fertility returns quickly as soon as it is removed.[10-14]This study helps to determine the socio economic and demographic factors associated with immediate postpartum insertion of copper T and it also helps to determine the complications.

II. Material and Methods

This is a prospective observational study to assess the acceptability, safety, efficacy and outcome of PPIUCD use in women inserted immediately after vaginal delivery. The study was conducted at

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Department of Obstetrics & Gynecology, Jhalawar Medical College, Jhalawar over a period of one year from November 2018 to October 2019. Ethical approval for the study was obtained from hospital ethical committee. 203 women delivering in the hospital fulfilling the inclusion criteria were included in the study. Post placental insertion of IUCD CuT 380A was done under sterile conditions and antibiotic coverage to ensure asepsis in the mother. Informed written consent was taken from mother before insertion.

Inclusion criteria: All the women with singleton or multiple pregnancy delivering vaginally at Jhalawar medical college were included in the study.

Exclusion criteria: Women who did not provide informed consent, history of antepartum hemorrhage, PROM > 18 hours, postpartum hemorrhage, Fever during labour and delivery, anomalous uterus, chorioamnionitis, HIV positive mothers taking ART, patients with previous allergic reaction to IUCD, history of lower genital tract infections or active STD.

A questionnaire was used to collect data from the patients, which included socio demographic data, previous contraceptive history and awareness about PPIUCD. All women were advised to come for follow up at 15 days, 6 weeks and 3 months following IUCD insertion. A follow up card was given to all the women containing information regarding type of PPIUCD inserted, insertion date, date of expiry, date of follow up visits, patient's phone no. During follow up visits, data was collected regarding complaints, willingness to continue Cu T, request for removal, willingness for reinsertion if expelled. Speculum examination was done to see the strings of IUCD and to rule out any local infection of cervix and vagina.

III. Result

In this study, majority of the women were aged between 21-25 years (53.7%), most of the women (48.3%) had completed their primary education, 95.1% of women were housewives. Most of the women (69.5%) belonged to rural area. Majority of the women (53.7%) were multipara and most of the women (50.3%) had one living child. Majority of the women (61.6%) had one living male child. The gross cumulative removal, expulsion and continuation rates were 7.9%, 12.8% and 68.9%.There was one case of pregnancy with IUCD in situ and no cases of perforation or other major complications were noted.

Table 1: Patient's particulars

Particulars		Number	Percentage
Age	Up to 20 yrs.	29	13.8
	21-35 yrs.	171	84.7
	>35 yrs.	3	1.5
Education	Illiterate	42	20.7
	Primary	98	48.3
	Secondary	48	23.6
	Degree/Diploma	15	7.4
Occupation	Housewife	193	95.1
	Employed	10	4.9
Living area	Rural	141	69.5
	Urban	62	30.5
Parity	Primipara	94	46.3
	Multipara	109	53.7
No. of living children	1	101	50.3
	>1	102	50.7
Religion	Hindu	187	92.1
	Muslim	16	7.9
Awareness of IUCD	Yes	90	44.3
	No	113	55.7

Table 2: Awareness of PPIUCD and Literacy

Education	Awareness of PPIUCD			
	YES (Number)	YES (%)	NO (Number)	NO (%)
Illiterate	2	2.22	40	35.39
Primary	29	32.22	69	61.06
Secondary	45	50	3	2.65
Degree /Diploma	14	15.55	1	0.88

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Table 3: Reason for acceptance

Reason	Number	Percent
Long term	50	24.6
Safe	6	2.9
Reversible	138	67.9
Fewer clinical visits	9	4.4

Table 4: PPIUCD acceptance in relation with sex of child

	Number	Percent
Women having male child	125	61.6
Women having no male child	78	38.4

Table 5: Reason for Removal of Cu T

Reason	15 Days	6 Weeks	3 Months
Abdominal pain	2	5	0
Heavy menstrual bleeding	0	1	1
Psychosocial causes	2	1	2
For permanent sterilization	0	1	1

Table 6: Complications during follow up

Complications		15 Days n= 182	6 weeks n=155	3 months n=144
No complaints		162 (89.0%)	135 (87.1%)	129 (89.6%)
Heavy menstrual bleeding		0	6 (3.9%)	13 (9.0%)
Abdominal pain		4 (2.2%)	9 (5.8%)	3 (2.1%)
Missing strings		0	7 (4.5%)	2 (1.4%)
Expulsion	Complete	23 (12.6%)	3 (1.9%)	0
	Partial	0	0	0
White discharge		0	0	1 (0.7%)
Pregnancy		0	0	1 (0.7%)

Table 7: Continuation rates with/without complications

Problem	Total cases	Removal of Cu T	Continuation of Cu T
Heavy menstrual bleeding	19	2	17
Abdominal Pain	16	7	9
Missing strings	9	0	9
Expulsion	26	26	
White discharge	1	0	1
Pregnancy	1	1	
No complication	110	6	104

IV. Discussion

The postpartum period is potentially an ideal time to begin contraception as women are more strongly motivated to do so at this time, which also has the advantage of being convenient for both women and health-care providers. IUCD insertion in postpartum period provides a good opportunity to achieve long term contraception with minimal discomfort to woman. The intrauterine devices provide reversible long lasting and effective method of birth control.[15,16,17] In this study, majority of the women 108 (53.7%) were aged between 21-25 years. This is similar to a study conducted by Singal et al which found mean age of PPIUCD insertion to be 23.12+/-2.42 years.[18]This shows that PPIUCD usage as a method of contraception is more among young females rather than among teenage pregnancies. The education status of the study group was analysed to understand the role of education in PPIUCD acceptors. Majority of women had some form of education. This shows that women who had some formal education were willing to accept PPIUCD.

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Educated women understand the risk of close pregnancies and willing to space out pregnancy by using PPIUCD. This was similar to the studies conducted by Safwat et al[19], Anjali et al[20,] Gunjan et al[21] and Vidyaraman et al.[22]Uneducated women tend to overlook the benefits and their decision making is highly influenced by their family members. Educated women tend to voice out their concerns and this facilitates in removing their misconceptions over PPIUCD. It is easy to convince an educated woman about the benefits of PPIUCD usage. Higher educated women also had lower acceptance of PPIUCD as they have easy access to other methods of contraception like condoms, OCPs and permanent sterilization. Majority of the women in this study were housewives. Most of the women (69.5%) in the study group belong to rural area. The acceptance of PPIUCD was higher among the rural women as compared to urban women. This is because the women of urban areas rely on other methods of contraception like OCPs, injectable hormonal contraceptives, condoms, permanent sterilization. Katheit G et al[23] found that acceptance of PPIUCD was almost equal among rural (47.6%) and urban women (52.4%). This clearly indicates that training to ASHA, ANMs and anganwadi workers and integrating this method in national programmes like National rural health mission has contributed significantly in family planning programme. Majority of the women in this study were multiiparous. This is similar to studies by Grimes et al[24], Shukla M et al. [25], Borthakur S et al.[26], Goswami G et al[21] and Maluchuru S et al.[27] Mishra S,[28] Gautam R et al[29], Vidyarama R et al[22] and Anjali et al found a higher acceptance in primipara. Some studies shows that women with higher parity prefer permanent mode of contraception unlike primiparous women who use PPIUCD to space out their pregnancy. The study group was analysed according to the number of living children. It was found that (50.3%) women had one living child. This shows that majority of women with one living child are willing to use PPIUCD as a method of contraception. This was similar to the studies by Kumar S et al[30]andBhalerao AR et al[31]. Contrary to the present study, Katheit G et al [23] found that 35.76% of total PPIUCD acceptors were having 2 children. According to Patel and Khan,[32] men approve use of contraceptive only after having 2 or 3 children.

Awareness of IUCD was 44.3%. In a study conducted by Gujju RLB et al,[33] only 54% of the women were aware of IUCD before they received counselling. Awareness of IUCD has a direct relation with women's education. According to Ullah and Chakraborty,[34] women's education was the most important determining factor for contraceptive use.

The reasons for acceptance among women was analysed in the study. Most women preferred PPIUCD for the reversible nature. This was contrary to the studies by Satyavathi et al [27]and found that reasons for IUCD acceptance were long acting nature in 55.28% and 20.73% due to safety. PPIUCD has many advantages including its reversibility, not requiring regular user compliance, lack of systemic side effects, coitus independent, no interference with breast feeding.

In this study it was found that the acceptance of PPIUCD was more in women who had at least one living male child. In a society that values highly a male child, it probably was reassuring to the women that by having a male child a significant milestone has been achieved. Therefore they were more inclined to accept PPIUCD. The study by Bhalerao and Purandare[31] reported that acceptance was high among women who had at least one male child.

In this study, out of 203 women, 21(10.3%) women were lost to follow up. Among the remaining 182 acceptors, 26 women spontaneously expelled PPIUCD. The gross cumulative expulsion rate at the end of 3 months was 12.8%. All the expulsions occur within 6 weeks.

Gunjan et al[21] reported 10% expulsion rate and 30% lost follow up. Sangeetha et al[35] study resulted 6.8% expulsion. Kittur et al.[36] reported 5.23% expulsion rate and they also concluded that the expulsion rate could be minimized if the insertion was done by trained person and proper fundal placement was assured.

In this study, expulsion rate was high in primiparous women than multiparous women. This finding was contrary to other studies in which expulsion rate was high in multiparous women which is very significant due to parous cervix in multiparous women. According to Gupta et al[37] expulsion rate was significantly higher in multiparous women (4.67%) compared to primiparous women (2%) following vaginal PPIUCD insertions. The higher rate of expulsion in primiparous women can be misleading because it can be due to wrong reporting by the PPIUCD acceptor women. May be these women had voluntarily removed the PPIUCD under family pressure. As education level is low in Jhalawar, uneducated people have many taboos for PPIUCD like it can decrease fertility or it can cause ill effect on health. Due to these psychosocial factors, a woman can remove PPIUCD voluntarily and can misguide the Doctor that it has been expelled spontaneously.

In this study, analyzing the complications following PPIUCD insertions, heavy menstrual bleeding and pain abdomen was the most common complains. This was similar to the studies conducted by by Satyyawathi et al[27], Farhat Arshad et al[61]and Gunjan et al[21].

In the present study, one case of failure in the form of pregnancy was observed. Eroglu et al[38] found 2/84 pregnancies in post placental Copper-T 380A, 2/43 in early postpartum (10 min-72 hrs) and 4/130 in interval insertion group at 1 year of follow up. Contrary to this, Ricalde et al[25] reported no pregnancy after 1 year of

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insertion of Cu-T380A or Multiload Cu-375 in post placentally and in early postpartum period.Gupta et al,[39] also found no failure at 6 months of follow up in both immediate insertion and delayed insertion group.

In the present study, no case of perforation was seen. The possible reason could be due to thick post-partum uterine wall immediately after delivery. In this respect, this study was consistent with other studies conducted by Shukla et al[70], KitturS et al[40].

In this study, 16 (7.9%) women requested removal of PPIUCD for various reasons. Most common reason was pain abdomen. This was contrary to the study by Satayvathi et al[27] in which bleeding was the commonest reason for removal.

In the present study, 19 women had heavy menstrual bleeding but only 2 women wanted removal. 16 women had pain abdomen and out of these 7 women wanted removal. Celen et al[37] study reported 23.5% incidence of bleeding but only 14.71% wanted removal, while the remaining retained IUCD with reassurance. Positive attitude of the patient plays a significant role in continuation of PPIUCD.

In this study, the continuation rates at 15 days, 6 weeks and 3 months postpartum were 76.4%, 70.9%and 68.9% respectively. Raffat Sultana et al[41] reported continuation rates of 94%, 92% and 82.6% at 1 week, 6 weeks and 6 months postpartum respectively. Anjum Afshan et al[42] reported continuation rates at 6 weeks and 6 months were 90% and 84% respectively. Sahaja Kittur et al[50] reported continuation rate of 86.19% at 6 weeks follow up.

V. Conclusion

Immediate postpartum intrauterine contraceptive device is a safe, effective and long lasting reversible contraceptive method to women in the delivery setting. Women are highly motivated during the postpartum period and receptive to family planning advice and no additional visit to hospital is required. PPIUCD is very safe with minimal side effects. Majority of the PPIUCD were inserted after proper counseling, but no one underwent reinsertion following spontaneous expulsion which indicates that even more information regarding the advantages and disadvantages of all the available methods and PPIUCD have to be explained to decrease the unmet need of the family planning services.

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Pregnancy in a Patient with RETT SYNDROME Mutation: Dilemmas in Management

By Dr. Srimathy Raman, Dr. Harshala Shankar, Dr. Priyanka Shekarappa, Dr. Savitha Shirodkar & Dr. Padmalatha Venkataram

Abstract- Rett syndrome, a neurodevelopmental disorder is caused by MECP2 gene mutations inherited sporadically or x linked dominant fashion. It almost exclusively affects girls. Genetic testing can help in preventing recurrence by offering prenatal diagnosis in affected families. We discuss the case of a patient who had such a mutation and discuss her pregnancy outcomes.

Keywords: Rett syndrome; MECP2 mutation; Neuro-developmental; X linked dominant, skewing; genetic counseling; exome sequencing.

GJMR-E Classification: NLMC Code: WQ 240



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Dr. Srimathy Raman [α], Dr. Harshala Shankar [σ], Dr. Priyanka Shekarappa [ρ], Dr. Savitha Shirodkar [ω] & Dr. Padmalatha Venkataram [¥]

Abstract- **Rett syndrome, a neurodevelopmental disorder is caused by MECP2 gene mutations inherited sporadically or x linked dominant fashion. It almost exclusively affects girls. Genetic testing can help in preventing recurrence by offering prenatal diagnosis in affected families. We discuss the case of a patient who had such a mutation and discuss her pregnancy outcomes.**

Keywords: Rett syndrome; MECP2 mutation; Neuro-developmental; X linked dominant, skewing; genetic counseling; exome sequencing.

I. Introduction

Rett syndrome (RTT) is an X-linked neurodevelopmental dominant disorder and so affects almost exclusively girls. It occurs because of mutations in the MECP2 gene, which can be inherited or can happen sporadically. We discuss the management of a patient, who had this mutation, which was discovered on genetic evaluation in her third pregnancy. We discuss the role and importance of genetic testing in identifying and preventing recurrences.

II. Case Summary

Twenty-eight years old lady who was in her third pregnancy presented to our hospital for booking at nine weeks gestation. Her previous two children, both girls, had developmental delays, though there was no actual diagnosis. It was a second-degree consanguineous marriage. The first child was six years old and had developmental delay, mild dysmorphism, spasticity, and seizures. She was suspected of having spastic cerebral palsy. Karyotype was performed, and it was normal. The second child was three years old, and the child also has similar phenotypic features like the first child. The child was started on physiotherapy and speech therapybut was not evaluated.

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The current presentation was at nine weeks in this third pregnancy. The history made us suspect that the children might be suffering from more than just spasticity with the possibility of an underlying genetic cause for the spasticity. So, the family was offered genetic counseling and testing.

Genetic testing was initially performed on their second child, and that revealed a missense variant in the MECP2 gene, which was a pathogenic variant. The couple, their first child, and the amniotic fluid of the present fetus were then tested for the genetic mutation. The mother, first child, and the amniotic fluid tested positive for the mutation while the father was normal. The results are as shown in table 1.

The tested fetus is a heterozygous carrier of the pathogenic variant like the earlier two siblings who are also heterozygous for the reported variant. So, the fetus carries a risk of being affected like the earlier two children siblings. The mother, despite having a similar genetic makeup, was normal. Hence it would not be possible to predict the exact phenotype with certainty. Post-test counseling was given to the couple who decided against termination. She had an uneventful pregnancy and delivered a healthy female baby at term. They have been advised close monitoring and follow-up of the baby.

III. Discussion

Rett syndrome, caused by mutations in the MECP2 gene, causes severe mental retardations in females. The estimated prevalence is 1 in 10,000 to 15,000 girls[1]. Classic cases present around the first year of life with neurological regression and brain growth impairment after a normal development in the neonatal period[2]. The disease results in regression, with loss of previously acquired speech. They also have seizures, autistic features, and severe limitations in motor skills. Our patient's both children had the typical features.

The MECP2 gene is important for formation of MECP2 protein. This protein is variably expressed in different tissues but particularly abundant in braincells[3]. It may regulate gene expression by modifying chromatin, and it possibly plays a role in maintaining synapses.

Rett syndrome can be sporadic or inherited in an X-linked dominant manner. Most of the cases are sporadic and happens because of a denovo mutation.

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However, it could also be related to germline mosaicism. The gene could also be transmitted vertically from asymptomatic carrier mothers. With carrier mothers, there is a 50% risk that the offsprings can be affected. The mothers may be asymptomatic carriers because of favorable skewing of x chromosome inactivation, and hence they do not have the typical features.

Variable X inactivation can lead to different phenotypes-healthy carrier females to mild and severely affected females and severe congenital encephalopathy in males despite having the same mutation. X inactivation studies may not be very reliable in predicting the disease severity [4]. Carrier mothers with favorable skewing may have minimal to no clinical abnormalities like our patient. However, it is difficult to predict the outcome of this baby who needs close monitoring.

Recurrence, as discussed earlier, can be due to asymptomatic nonpenetrant carrier mothers or to parental germinal mosaicism for the MECP2 mutation. Since germline mosaicism can neither be predicted nor detected, families with one affected patient can benefit from prenatal diagnosis.

IV. Conclusion

It is important to think of possible genetic inheritances in patients with a strong family history of developmental problems and consanguinity. Genetic counseling and discussion of reproductive choices in carrier couples, including prenatal diagnosis and preimplantation testing, help to prevent recurrence in future pregnancies.

Informed consent: The authors thank the patient for her consent to publish this case.

Author contribution: Srimathy Raman was responsible for the content of the manuscript. The other authors supervised the drafting and editing of the manuscript.

Conflict of interest: The case was presented as a poster in Karnataka State Obs and Gyn Association meeting, Shimoga, Karnataka, 2017, and CUSP Conference, Chennai 2018. There are no other conflicts of interest to declare.

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Table 1: Exome sequencing analysis result

Patient ID	Zygosity	Exon #	Chromosomal Coordinates	HGVS Nomenclature	Amino Acid change	Carrier Status
Mother X	Heterozygous	3	chrx:153296711	NM_001110792.1	p.Arg202Cys	Obligate Carrier
Father Y	Homozygous (wild type)	3	chrx:153296711	NM_001110792.1	p.Arg202Cys	Normal (Wild type)
Child A	Heterozygous	3	chrx:153296711	NM_001110792.1	p.Arg202Cys	Affected
Child B	Heterozygous	3	chrx:153296711	NM_001110792.1	p.Arg202Cys	Affected
Amniotic Fluid-Fetus	Heterozygous	3	chrx:153296711	NM_001110792.1	p.Arg202Cys	? Carrier/ ?Affected

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Women and Pregnancies as an Immediate Target against the Obesity Epidemic

By Pierre-Yves Robillard

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Abstract- The author wishes to enlarge an important current debate among obstetricians trying to sensitize specialists of obesity/endocrinology/nutrition, and make them aware of a possible very important debate: having a "normal shaped" baby (neither too small, nor too big, 10% of SGA, small for gestational age and 10% of LGA, large for gestational age), is possible by an optimal gestational weight gain (optGWG) during pregnancy. This is a simple mathematical linear equation, y= ax+b (y being optimal gestational weight gain, optGWG, x being pre-pregnancy body mass index, ppBMI). Beginning with severe obesity (36 kg/m^2), women should not gain weight during their pregnancy, while they should lose weight in higher BMIs (e.g. losing 6 kg for a 40 kg/m^2 morbid obese). This is predictable since the first trimester of pregnancy.

Keywords: *preeclampsia, gestational diabetes, obesity, epidemiology, gestational weight gain, caesarean sections.*

GJMR-E Classification: *NLMC Code: WQ 240*



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Women and Pregnancies as an Immediate Target against the Obesity Epidemic

Pierre-Yves Robillard

Abstract- The author wishes to enlarge an important current debate among obstetricians trying to sensitize specialists of obesity/endocrinology/nutrition, and make them aware of a possible very important debate: having a "normal shaped" baby (neither too small, nor too big, 10% of SGA, small for gestational age and 10% of LGA, large for gestational age), is possible by an optimal gestational weight gain (optGWG) during pregnancy. This is a simple mathematical linear equation, y= ax+b (y being optimal gestational weight gain, optGWG, x being pre-pregnancy body mass index, ppBMI). Beginning with severe obesity (36 kg/m²), women should not gain weight during their pregnancy, while they should lose weight in higher BMIs (e.g. losing 6 kg for a 40 kg/m² morbid obese). This is predictable since the first trimester of pregnancy.

We have previously shown by a mathematical simulation on 59,000 singleton term pregnancies that we could lower by 35/40% major complications like caesarean sections, late onset preeclampsia, and the harmful incidence of macrosomic babies (over 4 kg). After delivery, these women would further lose additional 5-10 kg (baby, placenta, amniotic fluid), and have a significant weight loss as compared with their ppBMI. This very encouraging achievement (along with a 9-month dialogue with health workers) should also trigger behavioural changes later in these women.

Conclusion: The pregnancy-strategy to convince obese women with the paramount motivation of the good of their babies has to be attempted. Besides actively counter balancing morbid effects of high BMIs in pregnancies (and, importantly for the future of mankind, by avoiding a lot of macrosomic and LGA newborns), should imply new habits in women's future lives afterwards.

Keywords: preeclampsia, gestational diabetes, obesity, epidemiology, gestational weight gain, caesarean sections.

Keywords: pregnancy, epidemiology, pre-pregnancy body mass index, gestational weight gain, caesarean section, obesity.

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Introduction

People with obesity worldwide has become a major challenge in this 21st century with an apparent irresistible rise of this epidemic since the 1970's [1,2]. Nowadays, it is evaluated that obese people (≥ 30 kg/m²) represent some one billion inhabitants (out of seven) on this planet [1,2]. Women (probably comprising more than 50% cases of total obesity cases) are particularly affected and this problem has become a major challenge for obstetric care [3]. But we may consider that pregnancy in obese women can be one of the best possibility of management and counselling: all pregnant women are prone to a monthly follow-up during 9 months. This kind of intense follow up and dialogue rarely exists in humans' lives and, there, we may have a major public health leverage of action.

We have recently shown that "There is a peculiar phenomenon: two separate individuals (mother and foetus) have a mutually interactive dependency concerning their respective weight" [4]. Based on the simple axiom: "what is the optimal gestational weight gain at term (optGWG) to achieve the natural rate of 10% of SGA (small for gestational age) as well as 10% of LGA (Large for gestational age) in newborns in my population".

Considering crude results on a reproductive population, only women with a normal BMI (20-24.9 kg/m²) seem to achieve a "natural" equilibrium in the newborns' SGA/LGA risk (both 10%). Very thin mothers have a higher risk of small for gestational age (SGA, until 25% of births) infants, and rarely give birth to a large for gestational age (LGA) infant. While morbidly obese women often give birth to LGA (until also 20-25% of births), and rarely to SGA. This equilibrium in the SGA/LGA risk (both 10%) is materialized geometrically by a crossing point: we proposed to call this crossing point the Maternal Fetal Corpulence symbiosis (MFCS) [4]. We have shown also that this MFCS point could exist in all women with an adequate gestational weight gain adapted to the maternal pre-pregnancy BMI. The optimal gestational weight gain (optGWG) to achieve this goal is a mathematical linear equation, y= ax+b:

$$\text{optGWG (kg)} = -1.2\ \text{ppBMI (Kg/m}^2\text{)} + 42 \pm 2\text{kg} \quad [4].$$

optGWG being optimal gestational weight gain. ppBMI being pre-pregnancy BMI.

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We concluded then: "IOM-2009 recommendations are adequate for normal and over-weighted women but not for thin and obese women: a thin woman (17 kg/m²) should gain 21.6 ± 2 kg (instead of 12.5-18). An obese 32 kg/m² should gain 3.6 kg (instead of 5-9). Very obese 40 kg/m² should lose 6 kg." [4] See Table 1.

We have put an online calculator consultable on smart phone at REPERE.RE (REseau PErinatal REunion), in three languages (French, Spanish and English) [5], adapted to the Reunionese women. We encourage any reader to validate these findings adapted to their own populations (it is easy to do if you know the specific SGA/LGA curves of your term -37-42 weeks gestation- newborns).

I. The Controversies on Gestational Weight Gain. [4]

Knowing the optimal gestational weight gain (GWG, from conception to birth) among the annual 135 million of human pregnancies is considered to be one of the "Holy Grails" to achieve for maternity health care providers and for women themselves. Extensive literature exists on the subject with, in background, the current international cornerstone which is the 2009-IOM recommendations [6] based on the WHO-BMI classification standardized in 2000 [7]: Since then a lot of controversies aroused on these recommendations, for example Asian people claim that their women are leaner than Caucasians, and that the International recommendations are too low. On the other hand, for obese women, the major controversies concerns the debate if severe and morbid obese women should lose weight during their pregnancy [8-14] (our results suggest that it should be the case, see Table 1). We already extensively discussed these controversies in another paper [4].

II. Lowering Important Maternal/fetal Morbidities by Achieving an Optimal Gestational Weight Gain (optGWG)

We have recently retrospectively tested the effect of achieving optGWG (± 2kg) in our reunionnese population by a mathematical simulation on a 18 -year (2001-2018) [15] and 19-year historical cohort. (2001-2019) [16] on 57,000, and then 59,000 term pregnancies. Achieving an optGWG in overweight-obese women should on the mother side almost halve the incidence of preeclampsia (major complication of human pregnancies, hypertension plus proteinuria) [15,16,17], diminish by some 30% the rate of caesarean sections and probably lower the rate of gestational diabetes mellitus (GDM) [16]. For newborns, while reaching a 10% rate of large for gestational age (the very definition of the linear equation), it would lower by 30 to 40% the rate of the harmful macrosomic babies (≥ 4 kg), prone to neonatal complications, and following morbidities in later life (cardiovascular diseases, obesity, type 2 diabetes, metabolic syndrome etc…) as well as tranfers of these babies in neonatal department [16]. Besides having significant health (and cost) benefits by lowering all these maternal/foetal complications, such interventions should convince and induce major changes of behaviour in these women during their pregnancies.

III. Physicians and Health Workers' Future Dialogue with Overweight/obese Women

Obese pregnant women being somewhere "captive" of a 9-month follow-up management of the problem may be caught at the root. First of all, and very important: our calculator [5] does not classify women in "guilty categories" (underweight/normal weight/ overweight/obese class I/obese class II or III). It simply counsels to each single woman (considered simply as a single plot on a curve) a personal goal of gestational weight gain to possibly achieve to have a "newborn in good shape" (neither too small, nor too big) since the first prenatal visit in the first trimester of pregnancy.

Women as they attempt to navigate pregnancy in a food environment that favors over-consumption of unhealthy foods and a world where the demands of life limit the amount of time available for physical activity. Therefore, it is well-known how it is difficult to make obese people losing weight (diet counselling, physical exercises etc…[2, 18-19]). We propose that the perspective to have a "newborn in good shape" may be that time highly motivating to women with obesity. If we take the example of a severe obese 36 kg/m² (see Table 1), she should not take any pound or kilogram during her pregnancy. After delivering the baby (and the placenta), she would lose some 10-15 kg as compared to her basic state before pregnancy. We have shown recently that very severe obese should even lose weight during their pregnancy [21]. These two very encouraging achievements ("good-shaped baby" and personal loss of weight) would probably motivate these women to extend the new behaviours acquired during pregnancy.

IV. Conclusion

Being overweight/obese may not have to result in a higher risk of developing important maternal/fetal morbidities by establishing targeted and strictly monitored interventions on adequate GWG. We have certainly an achievable pathway to actively counterbalance the morbid effects of high BMIs; an approach urgently requiring adequately powered prospective trials. Lowering by 30-40% such major complications like caesarean sections, late onset preeclampsia, and, concerning newborns the harmful

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incidence of macrosomic newborns (over 4 kg) is of paramount importance. For the good of their babies, it is quite sure that, this time, obese women would be compliant to new behaviours (and perhaps follow them later on after delivery).

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Table 1: Comparisons between the current international recommendations for gestational weight gain (IOM 2009), and the linear equation. Being a linear equation, each woman may be considered as a single plot, and the calculations are then individualized.

IOM 2009 recommendations seem to be inadequate for underweight women, and on the other side for obese, beginning at 32 kg/m². Especially, from 36 kg/m² and upward, women should LOSE weight for this pregnancy.

We have validated this linear curve until 40-41 kg/m², as we did not had in our cohort enough morbid obese women (over 40 kg/m²). Moreover, and especially, we had not enough women who had actually lost weight during their pregnancy to test it (if we extrapolate this curve, a woman with a pre-pregnancy BMI of 45 kg/m² should lose 12 kg).

In bold italic, GWG in disagrement with IOM 2009 recommendations

MATERNAL CORPULENCE (PRE-PREGNANCY BMI)	GESTATIONAL WEIGHT GAIN (GWG) IOM 2009 RECOMMENDATIONS []	PROPOSED LINEAR MODEL To have "normally shaped newborns"[3]
Underweight women < 18.5kg/m²	12.5-18 kg	*22.8 kg (16 kg/m²)* *21.6 kg (17 kg/m²)* *20.4 kg (18 kg/m²)*
Normal weight women 18.5-24.9 kg/m²	11.5-16 kg	*19.2 kg (19kg/m²)* *18 kg (20 kg/m²)* 16.8 kg (21 kg/m²) 15.6 kg (22kg/m²) 13.2 kg (24 kg/m²) 12.1 kg (24.9 kg/m²)
Overweight women 25-29.9 kg/m²	7-11.5 kg	12.0 kg (25 kg/m²) 10.8 kg (26 kg/m²) 8.4 kg (28 kg/m²) 7.2 kg (29 kg/m²)
Obesity class I 30-34.9 kg/m²	5-9 kg	6.0 kg (30 kg/m²) 4.8 kg (31 kg/m²) *3.2 kg (32 kg/m²)* *2.4 kg (33 kg/m²)* *1.2 kg (34 kg/m²)*
Obesity class II 35-39.9 kg/m²	5-9 kg	*0 kg (35 kg/m²)* *Minus 1.2 kg (36 kg/m²)* *Minus 2.4kg (37 kg/m²)* *Minus 3.6 kg (38 kg/m²)* *Minus 4.8 kg (39 kg/m²)*
Obesity class III Over 40 kg/m²	5-9 kg	*Minus 6 kg (40kg/m²)* *Minus7.2 kg (41 kg/m²)*

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A Retrospective Study: Twin Pregnancy at Tertiary Care Centre, Maternal and Perinatal Outcome

By Dr. Nitesh Meena, Dr. Rajendra Prasad Rawat & Dr. Heena Kaurani

Abstract- *Background:* The objective of present study was to study the maternal and perinatal outcome in twin pregnancy in a tertiary care canter.

Methods: Retrospective analytical review of all twin deliveries at J.K Lon hospital, Govt. medical college Kota, over a period of 1 year between January 2020 and December 2020.There were 60 twin deliveries. Maternal details, antenatal complications and fetal outcome were analysed.

Results: The incidence of twin pregnancy was 1.4 % with maximum incidence in age group of 20 -29 years and in multigravida. Vertex - vertex fetal presentation was most common presentation. Most frequent mode of delivery was caesarean section (76.6%). Preterm labour was most common maternal complication (75%), followed by anaemia (60%).

Complications in perinatal period were birth hypoxia (35%), intrauterine growth restriction (13.3%), hyperbilirubinaemia (10%) and neonatal sepsis (3.3 %). 85% of the new-borns were LBW. Perinatal mortality in our study was 15%.

Keywords: *twin pregnancy, maternal outcome, perinatal outcome, preterm labour.*

GJMR-E Classification: *NLMC Code: QS 642*



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Conclusions: Twin pregnancies were seen to be more in the younger age group. Preterm labour, anaemia, hypertension and malpresentation were the main complications while caesarean section was the most common mode of delivery. Diachronicity led to less fetal complications and low perinatal mortality. Early active intervention in twin gestation can reduce the maternal and fetal mortality and morbidity.

Keywords: twin pregnancy, maternal outcome, perinatal outcome, preterm labour.

I. Introduction

Multiple gestation is considered a high-risk pregnancy. Currently, multiple gestations constitute up to 3% of all pregnancies.[1] There has been an increase in incidence of twins due to multiple reasons such as a rise in the number of women conceiving at an advanced age and in increase in use of assisted reproductive techniques.[2] Twin pregnancy is associated with increased maternal and perinatal morbidity and mortality as well as healthcare costs.[3]

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Twin pregnancy imposes greater demand on maternal physiological system. There is an increase in occurrence of many complications like hypertensive disorders, anaemia, gestational diabetes mellitus (GDM), preterm labour, preterm premature rupture of membranes (PPROM), and placental abruption. It is also responsible for repeated antenatal admissions, longer hospital stay, and blood transfusions. It is associated with increase in operative vaginal or caesarean delivery, post-partum haemorrhage and hysterectomy. It eventually contributes to the three major causes of maternal mortality: post-partum haemorrhage, venous thromboembolism and hypertensive disorders.[4]

II. Methods

This is a retrospective study, which was conducted at J.K.Lone hospital, Govt. Medical College Kota. 60women with twin pregnancies admitted to the labour room between January 2020 and December 2020 were included in the study. Ethical approval was taken from ethical committee before commencement of the study. Variable patient parameters like age, parity, and duration of gestation, physical examination, mode of delivery, antepartum, intrapartum and postpartum complications were collected. Data was retrieved from patient's case-notes and supplemented by information from the labour ward, postnatal ward, operation theatre and medical record department.

Inclusion criteria included all twin gestations admitted to the labour room between 28 to 38 weeks gestation and both twins alive at time of randomization.

Exclusion criteria were lethal fetal anomaly of either of the fetus. Women with pregnancies less than 28 weeks of gestation were excluded from the study.

III. Results

Out of the total 4285 antenatal patients delivered during the period of 1 year from January 2020 to December 2020 in our hospital, 61 patients presented with multiple pregnancy. Of these, one had triplet pregnancy and was excluded from our study and rest 60 were cases of twin pregnancy. The incidence of twin pregnancy in our study was 1.4%. The distribution of cases in relation to maternal sociodemographic profile is shown in table 1. Maximum numbers of women (70%)

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were in their peak fertile age i.e., in between 20- and 29-years age. The twins were seen 63.3% among the multi and 36.6% primi gravidas. 68.3% women had registered them for antenatal care and were attending antenatal clinic regularly and 31.6% who were not regular on the antenatal check u. Only 83.3% of women delivered before 37 completed weeks of pregnancy (Table 1).

Table 1: Demographic and obstetric profile of the patients (n=60).

Maternal profile	Number	Percentage
Age distribution		
< 20 yrs.	4	6.6%
20-29 yrs.	42	70%
30-35 yrs.	8	13.3%
> 35 yrs.	6	10%
Parity distribution		
Primi	22	36.6%
Multi	38	63.3%
Registration status		
Booked	41	68.3%
Unbooked	19	31.6%
Gestational age		
< 28 wks.	3	5%
28-32 wks.	8	13.3%
32-37 wks.	39	65%
> 37 wks.	10	16.6%

With respect to chorionicity, 60% of women were dichorionic. Fourteen percent were monochorionic –diamniotic and 6% patients were monochorionic-monoamniotic. Chorionicity was unknown in 20% cases. Vertex- vertex (Vx-Vx) fetal presentation was most common presentation at delivery (52% patients) followed by Breech –vertex (B-Vx) in 18% women.

23.3% women delivered by vaginal route; The caesarean section rate was 76.6%. 31.6% of the caesarean sections were performed electively for fetal malpresentations. Emergency sections were performed for fetal distress, antepartum haemorrhage, cord complications, failure of progress of labour and for second of the twins. Anaemia was noted in (60%). Pregnancy induced hypertension was seen in 35% of women (Table 2).

Table 2: Maternal outcome

Maternal complication	Number	Percentage
Preterm labour	45	70%
HDOP	21	35%
Malpresentation	19	31.6%
Anaemia	36	60%
Hydramnios	4	6.6%
APH	2	3.3%
PROM	8	13.3%
GDM	1	1.6%
Caesarean section	46	76.6%
PPH	5	8.3%

Low birth weight (LBW) in our study was defined as birth weight of <2.5 kg and 85% of the new-borns were LBW. APGAR score of <7 at 1 min was seen in 63.3 % new-borns. Apgar score <7 at 10 min was reported in 66.6% new-borns. Prematurity and low birth weight predisposed majority of early neonatal deaths. These small babies suffered from respiratory distress (42 cases), intrauterine growth restriction (16cases), septicaemia (4 cases), hyper-bilirubinaemia (12 cases) and NICU admission (72 cases). Perinatal mortality in our study was 15%.(Table 3).

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Table 3: Fetal outcome

Fatal outcome	Number	Percentage
Birth weight		
< 1 kg	6	5%
1-1.5 kg	19	15.8%
1.6-2.5 kg	77	64.1%
> 2.5 kg	18	15%
NICU Admission	72	60%
RDS	42	35%
IUGR	16	13.3%
hyper-bilirubinaemia	12	10%
Septicaemia	4	3.3%
Perinatal mortality	18	15%
APGAR < 7 at 1 min	76	63.3%
APGAR > 7 at 10 min	80	66.6%

IV. Discussion

Twin pregnancies are high risk pregnancies requiring special care and multidisciplinary approach towards their management. The incidence of twin pregnancy in our study was1.4%, the possible reasons for the rise in number are referral to our hospital for better neonatal care in anticipation of complications in neonates. It was observed that these women with twin pregnancies were regular in antenatal visits irrespective of distance from home or parity. It was also observed that incidence of anaemia, hyperemesis, gestational diabetes and pregnancy induced hypertension in twin pregnancy was significantly higher as compared to singleton pregnancies. Majority of the women in present study (70%) were aged between 20 -29 years. This is consistent to a study by Spellacy et al where 55% were aged between 20 -29 years.[5] Parity distribution of our study showed 63.3 % patients as multipara which is consistent to report by Spellacy et al where 84.2% patients were multipara.

Conservative management with tocolytic drugs and steroid were administered prophylactically for prevention of preterm labour in 70% twin pregnancies. In the study many women were found to have had premature onset of labour resulting in premature babies. This observation is seen to have occurred in spite of precautions like adequate rest, prophylactic tocolytic administration and cerclage.

The present study was compared to a study which was done among all twin pregnancies admitted in Institute of Post Graduate Medicine and Research, Dhaka now Bangabandhu Sheikh Mujib Medical University (booked and unbooked cases were considered for the study).[6] Among primis and multigravidas the incidence of twins was 36.6% & 63.3%. In the Chaudhary study it was reported that twins were more common in multis (64.2%) as compared to primis (35.8%).[6] Chaudhary et al reports an incidence of 44% preterm delivery among twin pregnancies.[6] The present study shows an incidence of 83.3%. Placentation was determined by antenatal ultrasonography and inspection of placenta and membranes after birth. Dichorionic placentation was seen in majority (60%) in our study, which is comparable with Erdemoglu et al (69.3%) and Panwala et al (63.8%).[7,8] Vertex –vertex (Vx-Vx) presentation at delivery was most common fetal presentation in present study (52%) and was to be consistent with another study by Chowdhury et al (47.5%) and Panwala et al (51.4%).[8,9] Most frequent mode of delivery in our study was by lower segment caesarean section (76.6%), consistent to studies by Chowdhury and Sultana (49.1% and 56% respectively).[9,10] Preterm labour was found to be the most common maternal complication in our study seen in 70% cases. Preterm delivery rate in our study was 70% and we found a high preterm caesarean section rate of 20% in present study. This finding is in contrast to previous studies by Chowdhury, Sultana and Papicrnik where preterm delivery rates were 41.5%, 44% and 50.7% respectively.[9,10,11] Higher preterm delivery rate in present study could be attributed to higher incidence of associated obstetric and /or medical co-morbidities in our patients, necessitating early delivery. Anaemia was the second most common maternal complication in our study reported in 60% patients in present study whereas the corresponding figures reported by Chowdhury and Brown et al were 35.8% and 35.5% for anaemia.[9,12] Hence authors reported higher incidence of anaemia in our study. However, a much higher incidence of anaemia was found by Bangal et al (84%).[13] Among the women with twin gestation under study it was found that 36 (6.%) had anaemia, 19 (31.6%) were diagnosed with hypertension and 4 (6.6%) had hydramnios as compared to 35.8%, 22.6% and 5.7%respectively as reported by Chaudhary et al.[6] The incidence of APH and PROM were 2 (3.3%) and 8(13.3%) whereas Chaudhary reports an incidence 5.7% of APH and 3.8% of PROM.[6] Birth hypoxia was reported in 35% of neonates. The incidence of birth asphyxia was much higher among second coming twins (55.5%) than first coming twins (24.5%). Hypertensive disorders (PIH/ Pre-eclampsia/ Eclampsia) were reported in 35% patients in present study. This is higher in comparison to that observed in

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studies by Chowdhury et al and by Bangal et al where they were observed in 22.6% and 18% cases respectively.[9,13] Low birth weight and prematurity are known leading causes of perinatal morbidity and mortality. The incidence of birth hypoxia, perinatal deaths and NICU requirement increases as gestational age at delivery decreases. The same was noted in present study.

V. Conclusions

Twin pregnancies are high risk pregnancies with more obstetrical complications compared to singleton pregnancies. Preterm delivery is the most common obstetric complication and rate of caesarean section are more as compared to normal vaginal delivery. Managing twin pregnancy is still a big challenge to the obstetrician. The use of antenatal care services, identification and anticipation of complications, intrapartum management and good NICU facilities will help to improve maternal and neonatal outcome in twin pregnancies.

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Certificate, LoR and Momento **2** discounted publishing/year **Gradation** of Research **10** research contacts/day **1 GB** Cloud Storage **GJ** Community Access	**Certificate,** LoR and Momento **Unlimited** discounted publishing/year **Gradation** of Research **Unlimited** research contacts/day **5 GB** Cloud Storage **Online Presense** Assistance **GJ** Community Access	**Certificates,** LoRs and Momentos **Unlimited** free publishing/year **Gradation** of Research **Unlimited** research contacts/day **Unlimited** Cloud Storage **Online Presense** Assistance **GJ** Community Access	**GJ** Community Access

Preferred Author Guidelines

We accept the manuscript submissions in any standard (generic) format.

We typeset manuscripts using advanced typesetting tools like Adobe In Design, CorelDraw, TeXnicCenter, and TeXStudio. We usually recommend authors submit their research using any standard format they are comfortable with, and let Global Journals do the rest.

Alternatively, you can download our basic template from https://globaljournals.org/Template

Authors should submit their complete paper/article, including text illustrations, graphics, conclusions, artwork, and tables. Authors who are not able to submit manuscript using the form above can email the manuscript department at submit@globaljournals.org or get in touch with chiefeditor@globaljournals.org if they wish to send the abstract before submission.

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Authors must ensure the information provided during the submission of a paper is authentic. Please go through the following checklist before submitting:

1. Authors must go through the complete author guideline and understand and *agree to Global Journals' ethics and code of conduct,* along with author responsibilities.
2. Authors must accept the privacy policy, terms, and conditions of Global Journals.
3. Ensure corresponding author's email address and postal address are accurate and reachable.
4. Manuscript to be submitted must include keywords, an abstract, a paper title, co-author(s') names and details (email address, name, phone number, and institution), figures and illustrations in vector format including appropriate captions, tables, including titles and footnotes, a conclusion, results, acknowledgments and references.
5. Authors should submit paper in a ZIP archive if any supplementary files are required along with the paper.
6. Proper permissions must be acquired for the use of any copyrighted material.
7. Manuscript submitted *must not have been submitted or published elsewhere* and all authors must be aware of the submission.

Declaration of Conflicts of Interest

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Authors are solely responsible for all the plagiarism that is found. The author must not fabricate, falsify or plagiarize existing research data. The following, if copied, will be considered plagiarism:

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- Writings
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- Printed material
- Graphic representations
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2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

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The corresponding author should mention the name and complete details of all co-authors during submission and in manuscript. We support addition, rearrangement, manipulation, and deletions in authors list till the early view publication of the journal. We expect that corresponding author will notify all co-authors of submission. We follow COPE guidelines for changes in authorship.

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Unless specified in the notification, the Editorial Board's decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

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Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.

Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27" x 11'", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word "Abstract" in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper's subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.



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Format Structure

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.

Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Eletronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/ photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

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Tips for writing a good quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.



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6. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. Revise what you wrote: When you write anything, always read it, summarize it, and then finalize it.

8. Make every effort: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. Use proper verb tense: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. Pick a good study spot: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. Know what you know: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. Use good grammar: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. Arrangement of information: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. Never start at the last minute: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. Multitasking in research is not good: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. Never copy others' work: Never copy others' work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. Go to seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. Refresh your mind after intervals: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. Think technically: Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

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Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.



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Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
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- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.



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Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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