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Progress Made in Addressing Emergency Obstetric and Newborn Care Challenges in Zanzibar

By Prof. Andrea B. Pembe, Bruno F. Sunguya, Sebalda Leshabari, Stella Mushi, Chirsker Masaki, George Kiwango, Ali Hassan & Linda B. Mlunde

Muhimbili University of Health and Allied Sciences

Abstract- *Objective:* This study aimed to gather evidence of progress made in the provision of emergency obstetrics and newborn care (EmONC) services in Zanzibar.

Methods: This cross-sectional study was conducted in 83 health facilities in ten districts of Unguja and Pemba islands in Zanzibar in 2018 using the validated Averting Maternal Death and Disability (AMDD) program module.

Results: Proportion of non-EmONC facilities is lower compared to 2012 (35% vs. 55.7%). Moreover, partially BEmONC facilities have increased compared to 2012 survey (58.7% vs. 28%). Only 2.5% and 3.8% provided CEmONC and BEmONC respectively. Concerning population size, EmONC availability is met at only 33.3% while a similar number lacks Comprehensive EmONC.

Keywords: *emergency obstetrics and newborn care, CEmONC, BEmONC, maternal and newborn care, signal functions, maternal mortality.*

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Progress Made in Addressing Emergency Obstetric and Newborn Care Challenges in Zanzibar

Prof. Andrea B. Pembe [α], Bruno F. Sunguya [σ], Sebalda Leshabari [ρ], Stella Mushi [ω], Chirsker Masaki [¥], George Kiwango [§], Ali Hassan [χ] & Linda B. Mlunde [ν]

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Conclusions: There is a significant decline in non-EmONC Health facilities while those providing partially BEmONC services have increased while those that provide CEmONC and BEmONC services have declined in the same period. The minimum recommended level for EmONC met in only 33.3%.

Keywords: emergency obstetrics and newborn care, CEmONC, BEmONC, maternal and newborn care, signal functions, maternal mortality.

I. Background

Efforts to address maternal and newborn health in Low- and Middle-Income countries have resulted in mixed results globally (1). While some countries have registered success, about 830 women die every day from pregnancy- or childbirth-related complications, the majority from Low and Middle-Income Countries (2). Tanzania is not an exception in this trend as it recorded significant success in child health but continued to suffer from poor maternal outcomes (3). Such a trend helped the country to attain the millennium development goal for child health, but not in maternal health (4, 5). Notwithstanding the level of investment in maternal health in the country, maternal mortality has remained stagnant for over two decades (3). Challenges and attributes to such burden vary (6) making it difficult to use a single approach to address them, further increasing complexity of the maternal health landscape.

Like for Tanzania mainland, Zanzibar also suffers from poor maternal health while child health indicators are making positive strides. Maternal mortality in Zanzibar was 350/100,000 live births in 2016 (7). Facility-based data show an increase of maternal deaths from 187 per 100,000 live births in 2014 to 276 per 100,000 live births in 2016. Differently to another context, most of such deaths in Zanzibar occur within the health facilities owing to close proximity to health facilities for the 95% of the population (8). With such good access to health facilities, the main challenge was the quality of health services, particularly the emergency obstetric and neonatal care (EmONC) (9).

Ensuring better EmONC indicators calls for improvement of the nine signal functions of EmONC (10). The signal functions are the key interventions used to treat direct obstetric complications that arise during pregnancy and childbirth and cause the majority of maternal deaths (11). The signal functions include administration of parenteral antibiotics, administration of uterotonic drugs, administration of parenteral anticonvulsants for pre-eclampsia and eclampsia, manual removal of the placenta, removal of retained products of conception, the performance of assisted vaginal delivery and performance of basic neonatal resuscitation. Facilities able to perform all seven signal functions are classified as basic EmONC facilities while those who perform all basic services plus caesarean section and blood transfusion are Comprehensive EmONC facilities.

Monitoring the progress made with response to investment in maternal and newborn health, helps to

Author α §: MD, MMED, PhD, School of Medicine, Muhimbili University of Health and Allied Sciences, 9, United Nations Road, Upanga, P. O. Box 65001, Dar es salaam, Tanzania.
Author σ: MD, MSc, PhD, School of Public Health and Social Sciences, Muhimbili University of Health and Allied Sciences, 9, United Nations Road, Upanga, P. O. Box 65001, Dar es salaam, Tanzania.
e-mail: sunguya@gmail.com
Author ρ ω : BSc, MSc, School of Nursing, Muhimbili University of Health and Allied Sciences, 9, United Nations Road, Upanga, P. O. Box 65001, Dar es salaam, Tanzania.
Author ¥: BSc, MSc, Eastern Africa Statistical Training Center, P.O. Box 35103, Dar es Salaam, Tanzania.
Author §: MD, School of Medicine, Muhimbili University of Health and Allied Sciences, 9, United Nations Road, Upanga, P. O. Box 65001, Dar es salaam, Tanzania.
Author χ: Dipl. EHS, BSc CH, MIH, Ministry of Health, Revolutionary Government of Zanzibar, P. O. Box 2747, Zanzibar.
Author ν: MD, MSc, PhD, Implementation Science Tanzania Ltd, Block 20, Kibada Kigamboni, Tanzania.

gauge the effectiveness of the interventions. In Zanzibar, the ministry of health in collaboration with UNFPA conducted the first EmONC assessment in 2012 (8). Addressing the burden of maternal health needs continuous monitoring of signal functions for EmONC. The ministry therefore, called for another survey to examine progress if any made throughout the six years—in the year 2018. This paper reports the gains in particular for signal functions pertinent to EmONC.

II. Methods

a) Study design and settings

This cross-sectional study used a quantitative approach to examine progress made in maternal health services provision. A standardized questionnaire was used using face-to-face interviews. We conducted this study in the 83 selected health facilities providing maternal health services in Zanzibar. The facilities were from 10 districts in all five regions of Zanzibar (Zanzibar North, Zanzibar South, Town West, Pemba North, and Pemba South). Zanzibar has three levels of care in her health system: Primary level: Health Care Units and Centers (PHCUs, PHCU+ and Primary Health Care Centres-PHCCs); Secondary level: District Hospitals; and Tertiary level: Mnazi Mmoja National Hospital. Functionally, the PHCUs provide Primary health care services, while PHCU+ gives in addition, services such as delivery, dental, laboratory and pharmacy services. Moreover, PHCCs offers the same services as PHCU+ with the addition of inpatient and X-ray services. District hospitals deiver second line referral services, including simple surgical procedures and the tertiary hospital (Mnazi Mmoja Hospital) provides referral services.

b) Sampling

The research team worked with the technical experts from Ministry of Health who also participated in the previous EmONC study to select and list health facilities to be used for data collection that were used in 2012. The team conducted the current research in the similar health facilities included in the 2012 survey by Fakih and colleagues (8). They include: 30 health facilities in Pemba and 53 facilities in Unguja. Of the 83, a total of 48 were PHCU+ and above; 29 were PHCU; and 6 were private facilities ranging from low level to specialized maternity home. One was a military health facility that also takes care of public clients.

c) Measurements

The research team used the validated tool to gather data for signal functions in Zanzibar. The Averting Maternal Death and Disability (AMDD) program module (12) systematically assesses maternal and newborns case management which includes essential case management practices of women in labor and during delivery, care provided to newborn at birth including neonatal resuscitation, monitoring of babies and evaluate the appropriate use of medicines and equipment. The Open Data Kit (ODK), a free and open-source set of tools uploaded in the tablets was used to collect, synchronizes, and manages data.

d) Data collection

The trained research assistants collected data working in a team of three people in one facility supervised by one experienced researcher. We made five teams, each with four people. Three teams were deployed to Unguja and two in Pemba. Fifteen research assistants and five team leaders received one-week training. The training oriented research teams about data collection tools and process, standard guidance on research ethics and upholding confidentiality of respondents and data. The training workshop for research assistants and team leaders was finalized by practical aspect in two-selected health facility.

e) Analysis

All data were cross-checked every day for consistency and synchronized into a database for further analysis using STATA software. We conducted descriptive analyses and reported using frequency and percentages. We used the WHO handbook on monitoring emergency obstetric care to guide the description of the EmONC signal functions (11).

They include:

i. Administration of parenteral antibiotics.
ii. Administration of parenteral uterotonics.
iii. Administration of parenteral anticonvulsants.
iv. Manual removal of the placenta (MRP).
v. Removal of retained products.
vi. Assisted Vagina Delivery (AVD).
vii. Neonatal resuscitation.
viii. Blood transfusion, and
ix. Obstetric surgery.

III. Results

a) Availability of EmONC services

Table 1 shows the results of the facilities with CEmONC and BEmONC services three months before the survey. We analyzed data from 80 health facilities for the availability of EmONC services. Of the total facilities, only 2.5% provided CEmONC services, and 3.8 provided BEmONC services. The Mnazi Mmoja hospital, which is a national referral hospital in Zanzibar, was rated as a CEmONC facility. Of the five district hospitals, one was a CEmONC facility, while other four were rated as partially BEmONC facilities in this assessment. About 75% of PHCC facilities had BEmONC capacity while 80% of PHCU+ had partially BEmONC capacity. Only one in four of PHCU was of partially BEmONC capacity 71% were Non-EmONC facilities.

Table 1: Facilities with CEmONC and BEmONC services (N=80)

		Health Facility Status			
Health Facility Type	Total	CEmONC	BEmONC	Partially BEmONC	Non-EmONC
		n (%)	n (%)	n (%)	n (%)
Number of health facilities	*80*	*2 (2.5)*	*3 (3.8)*	*47 (58.7)*	*28 (35.0)*
National Hospital	1	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)
District hospital	5	1 (20.0)	0 (0.0)	4 (80.0)	0 (0.0)
PHCC	4	0 (0)	3 (75.0)	1 (25.0)	0 (0.0)
PHCU+	41	0 (0)	0 (0.0)	33 (80.5)	8 (19.5)
PHCU	28	0 (0)	0 (0.0)	8 (28.6)	20 (71.4)
Maternity hospital	1	0 (0)	0 (0.0)	1 (100.0)	0 (0.0)

b) Signal functioning

The nine signal functions were measured in all surveyed facilities and compared with those of 2012 survey (Figure 1). The results of the proportion of health facilities in the provision of each of the nine signal functions in health facilities three months before data collection. Evidence suggests that, only 50% of the hospitals that provide blood transfusion services in 2018 compared to 90% in 2012 survey. Cesarean sections were performed by more hospitals in 2018 compared to 2012 (80% vs. 70%). Health facilities performed newborn resuscitation more frequently in 2018 compared to 2012 survey (90% vs. 80%). In all other signal functions the 2012 study had higher ratings compared to 2012 in performance. For other health facilities, we observed better performance in terms of signal functions compared to 2012 survey for the use of parenteral uterotonics, parenteral antibiotics, parenteral antibiotics, and newborn resuscitation.

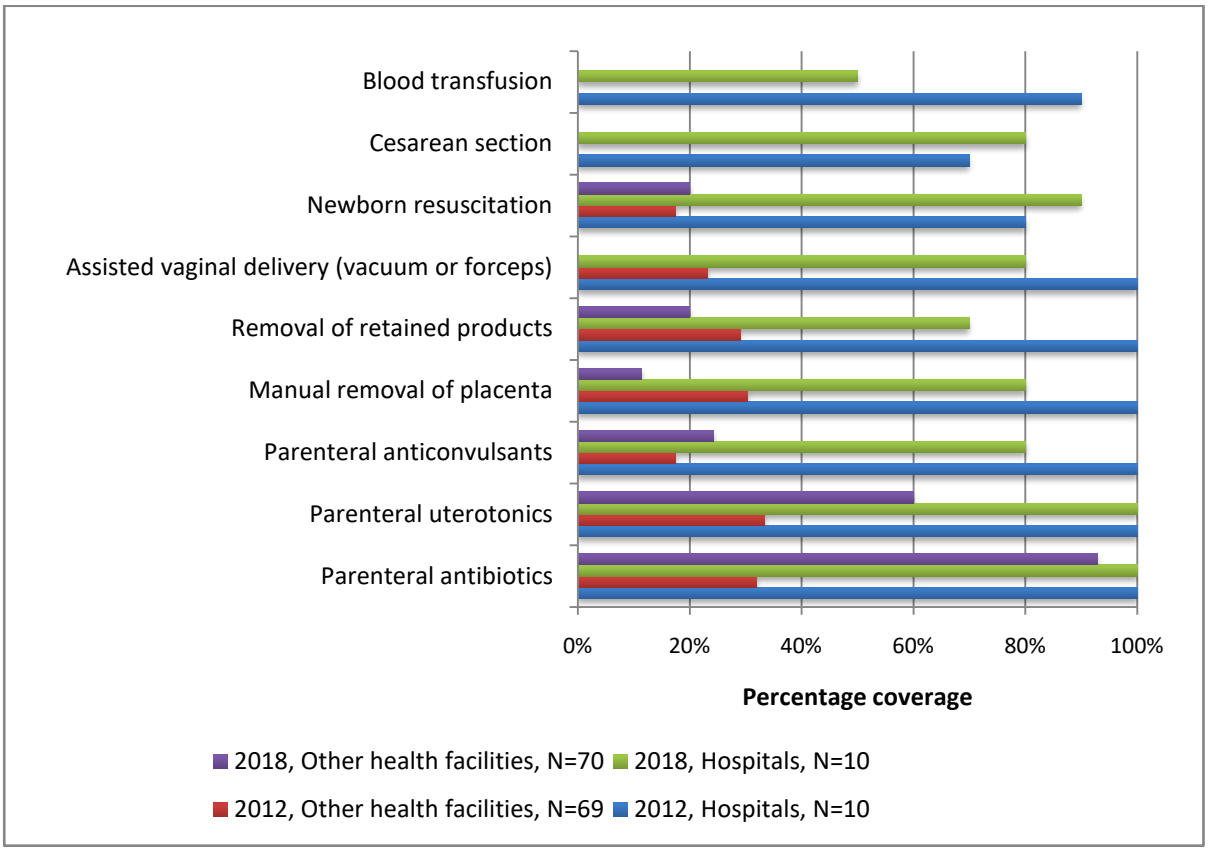

Figure 1: Health facilities providing signal functions for 2012 and 2018

c) *Minimum acceptable number of BEmONC and CEmONC facilities*

Table 2 shows the available health facilities providing EmONC services. Zanzibar needs a minimum of 15 EmONC facilities to meet the needs of 1.3 million people. This includes 3 CEmONC facilities. Of them, one CEmONC facility is required to serve Pemba and two for Unguja to adequately serve the population. In this stucy, Zanzibar met only 66.7% of required CEmONC facilities and only 33.3% of the required EmONC facilities. Pemba island had 100% of the required CEmONC facilities while only 40% of required EmONC facilities were available. Unguja island has only achieved30% of the required EmONC facilities but reached 100% of required minimum number of CEmONC facilities.

Table 2: Availability and status of health facilities in Zanzibar (N=80)

	Total Population	Surveyed facilities (all)	Existing BEmONC	Existing CEmONC	Min number of CEmONC	Overall min number of facilities required (Basic + Comp)	% of the facilities available (Basic + Comp)	% of Comp facilities available
Overall	*1,303,569*	*80*	*3 (3.8)*	*2 (2.5)*	*3*	*15*	*33.3*	*66.7*
By Zones								
Pemba	406,848	30	1 (3.3)	1 (3.3)	1	5	40.0	100.0
Unguja	896,721	50	2 (4.0)	1 (2.0)	2	10	30.0	100.0

d) *Key*

- % of the facilities available (Basic + Comp) = (Existing BEmONC + Existing CEmONC) / Overall min number of facilities required (Basic + Comp).
- % of Comp facilities available = Existing CEmONC / Min number of CEmONC.

e) *Distribution of health facilities in the visited districts*

Figure 2 shows that CEmONC health facilities were found in Chake-Chake and Mjini Magharibi districts. BEmONC health facilities were found in Micheweni, Kaskazini A, and Kusini.

IV. Discussion

Addressing maternal and newborn health challenges calls for strengthened health system responding to unprecedented burden thereof (13-15). It is critical to ensure Emergency Obstetrics and Neonatal Care (EmONC) services are strengthened to achieve the global and national targets (16). Moreover, tracking the progress in such efforts will help to determine the state of maternal and child health and remaining challenges. For this purpose, the ministry of health conducts periodic evaluations of EmONC in Zanzibar. The current survey was conducted to examine the progress made since 2012 (8) in EmONC in the two isles.

Evidence generated from the current survey suggests that, EmONC has deteriorated compared to that of 2012 (8). For every 500,000 populations, the minimum acceptable number of EmONC facilities is five and one of which should be CEmONC (11). Although the number of non-EmONC facilities has significantly reduced in Zanzibar compared to 2012 (35% vs. 55.7%), and that of partially BEmONC facilities increased compared to 2012 survey (58.7% vs. 28%), the minimum acceptable number of both basic and comprehensive services in Zanzibar according to the population size remains low. The current study found that, only 2 (2.5%) and 3 (3.8%) provided comprehensive and basic EmONC services respectively in Zanzibar. These results are different from those of the 2012 survey where more health facilities provided CEmONC services (9% in 2012 vs. 2.5% in 2018) and BEmONC services (7.6% in 2012 vs. 3.8% in 2018). Like in other developing countries (17, 18), disparity in urban and rural and areas according to EmONC were also obvious in Zanzibar. The facilities with reported EmONC capacity are in urban settings, creating further challenges in areas where majority of populations reside. This survey also showed uneven distribution of EmONC services available in Unguja and Pemba districts. The districts with higher Non-EmONC facilities were in Unguja compared to Pemba. This is also true for the regional distribution where, the two regions of Pemba had lower proportion of Non-EmONC health facilities compared to those of Unguja.

Majority of the population can access health services in Zanzibar owing to the high number of health facilities and their close proximity to the people. However, poor health system remains a barrier for quality health care. In this regard, most of maternal deaths occur within health facilities. Moreover, neonatal mortality trend has remained flat over the same period. Zanzibar reported 33 neonatal deaths for 1000 live births in 2010 compared to 25 neonatal deaths for 1000 live births in 2015 (3). Poor health system performance contributes to such trends (19). Interventions are known to reduce the burden of maternal and child mortality (20). One of the effective ways is by ensuring better indicators in signal functions constituting EmONC. It is however noted that such indicators are not getting any better in Zanzibar.

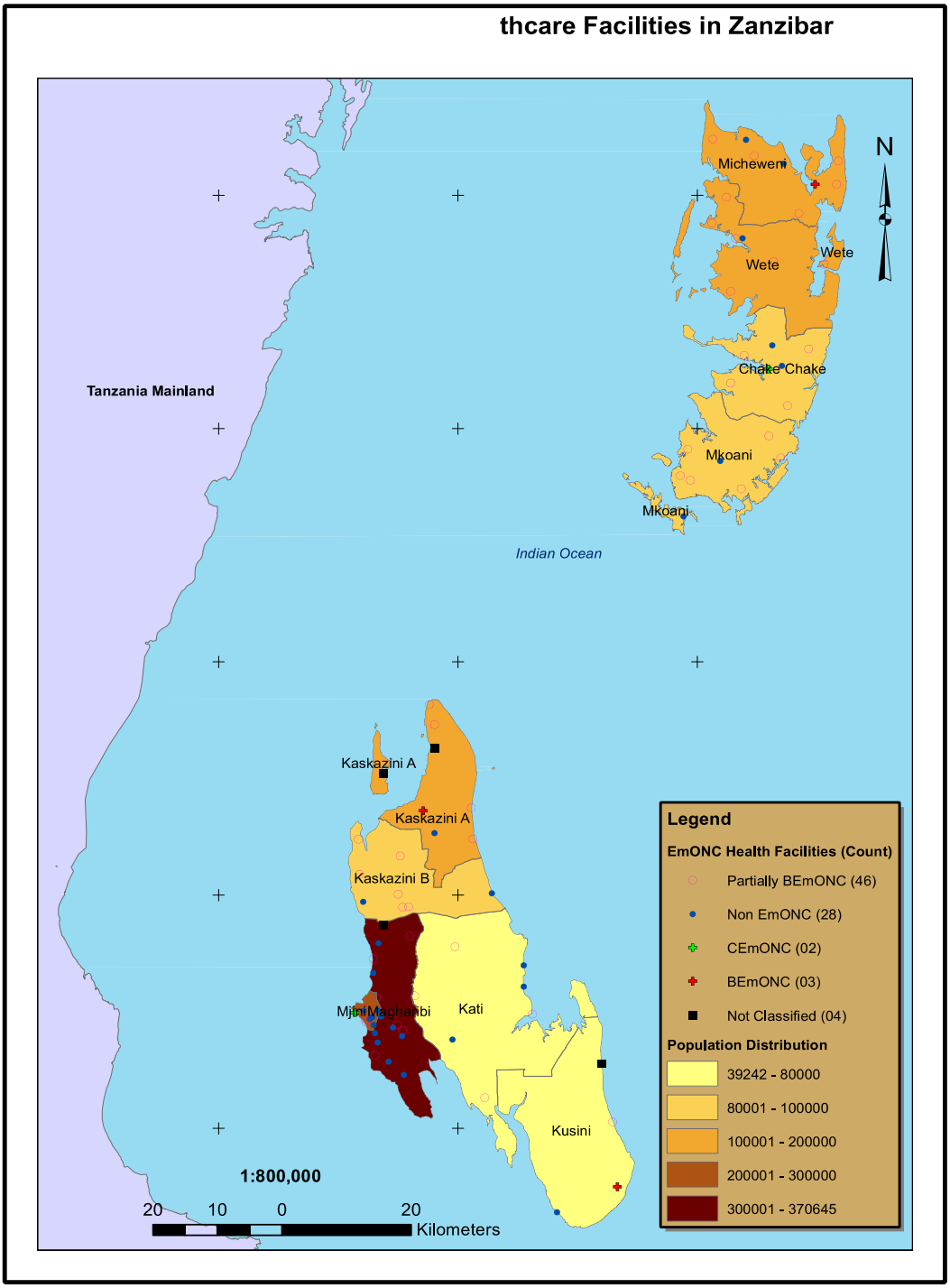

Figure 2: District Populations and distribution of health facilities included in the survey

The researchers made efforts to ensure quality of data presented in this study. However, even under such careful measures there is a need to interpret the findings with care owing to the following limitations. First, evidence on EmONC services availability relied on cases managed under the selected facilities within the three months before data collection. The reported absence of such services could also mean such case did not exist during the reported period or not registered. Lack of information may therefore not directly mean absence of capacity to handle such a case. This is a standardized method for determining signal function. The alternative method would be asking facility in charges on ability of their facilities to provide EmONC services, which again would be subjective to reporting bias. Second, the study design was cross sectional

which has causality limitation. Third, despite covering all districts and regions in Zanzibar, data on EmONC presented in this report lacks generalizability to the context beyond health facilities. Although antenatal attendance is high in Zanzibar, it is understood that delivery at home also remains common and therefore maternal complications may not feature in this report. Home delivery is significantly high in the isles (3).

In conclusion, Non-EmONC Health facilities deteriorated from 55.7% in 2012 to 35% in 2018. However, facilities with partially BEmONC services increased from 28% in 2012 to 58.7% in 2018. CEmONC and BEmONC facilities have declined, where the minimum recommended level for EmONC was met in only 33.3% facilities. Compared to Unguja, districts and regions in Pemba had better EmONC indicators. More efforts are needed to improve capacity of health facilities in providing EmONC services. This will also call for improvement of human resource capacity to conduct resuscitation, caesarean sections, as well as improving health facilities infrastructure, and increasing supplies needed to provide health care for ultimate improvement of maternal and new born health indicators.

Abbreviations

ANC: antenatal clinic.
AMDD: Averting Maternal Death and Disability.
EmONC: Emergency Obstetric and New-born Care.
MoH: Ministry of Health; ODK: open data kit.
PHCC: Primary Health Care Center.
PHCU: Primary Health Care Units.
PHCU+: Primary Health Care Units Plus.
SOPs: standard operating procedures.
UNFPA: United Nation Population Fund.
WHO: World Health Organization.

Ethical consideration

The research team worked with the Ministry of Health Zanzibar on necessary documents for ethical approval. All ethical guidelines were followed to ensure ethical conduct with participants. Authorities were contacted for their approval; the ministry issued an introductory letter from the ministry to each relevant authority. Participation into this study was voluntary, and researchers ensured confidentiality and privacy of participants. Participants signed an informed consent before interviews and were free to stop the interview at any time without repercussions.

Consent for publication

Study participants were informed on the dissemination of the finds without disclosing their personal identity and they agreed.

Availability of data and materials

The dataset analyzed during the current study are available from the corresponding author on reasonable request.

Competing interest

The authors declare that they have no competing interest.

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Authors' Contribution

ABP designed the study, coordinated data collection process, and critically reviewed the analysis process and manuscript. BFS led the data collection process, analysis, and drafted the manuscript. SL critically reviewed the results and the manuscript. SM conducted data collection and critically reviewed the manuscript. CM critically reviewed the manuscript. GK conducted data collection and critically reviewed the manuscript. AH conducted data collection and critically reviewed the manuscript. LBM conducted data analysis and critically reviewed the manuscript.

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The Effect of Combined Oral Contraceptives on the Bone Mineral Density in Perimenopausal Women

By M. O. Abdieva & D. D. Saidjalilova

Abstract- Increased life expectancy, lengthening of the reproductive period, early menarche and late menopause, chronic hyperestrogenism in the presence of relative or absolute progesterone deficiency, uncontrolled use of combined oral contraceptives, the formation of the metabolic syndrome are considered high-risk factors for the occurrence and progression of this pathology. Therefore, we aimed to study improvement the principles of preventing the loss and restoration of bone mineral density in women in the perimenopausal period. In women with unfavorable factors of menstrual, reproductive, somatic history in the perimenopausal period, there is a high incidence of the development of pathological decrease in bone mineral density. The use of combined oral contraceptives in the perimenopausal period contributes to the activation of bone remodeling processes.

Keywords: combined oral contraceptives; perimenopausal period; bone mineral density; metabolic syndrome; osteoporosis; osteopenia.

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The Effect of Combined Oral Contraceptives on the Bone Mineral Density in Perimenopausal Women

M. O. Abdieva [α] & D. D. Saidjalilova [σ]

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I. Introduction

A pressing problem of modern gynecology is the steady increase in the incidence of osteoporosis in perimenopausal women [1]. Osteoporosis is a systemic metabolic, skeletal disease, characterized by a decrease in bone mineral density in violation of its architectonics, and an increased risk of fractures. Low peak bone mass of women in the late reproductive period, decreased physical activity, poor nutrition, decreased levels and activity of sex hormones lead to the development of osteopenic syndrome and subsequently osteoporosis in women already in the perimenopausal period [2]. Insufficient coverage of this problem in the network of practical obstetric-gynecological care, the inopportuneness, and inadequacy of therapy aimed at normalizing bone mineral density leads to catastrophic bone loss and the occurrence of pathological bone fractures. In women 50 years and older, the risk of a pathological hip fracture is 23% [3]. In Uzbekistan, unfortunately, there is no reliable statistical base for the epidemiology of osteoporosis in perimenopausal women.

Increased life expectancy, lengthening of the reproductive period (early menarche and late menopause), chronic hyperestrogenism in the presence of relative or absolute progesterone deficiency, uncontrolled use of combined oral contraceptives, the formation of the metabolic syndrome are considered high-risk factors for the occurrence and progression of this pathology [4].

Combined oral contraceptives (COCs) are a universal group of drugs that simultaneously suppress bone resorption and stimulate bone formation [5]. Treatment is usually carried out within 6-12 months; preference is given to low-and micro-dosage drugs (prevention of thrombophilic complications). COC, which contains ethinyl estradiol 0.03 mg and drospirenone 3 mg (Yasmin), is a highly effective drug with a Perl index of 0.07, providing a stable weight. Drospirenone - progestogen new class - a derivative of spironolactone unique antimineralocorticoid properties prevents hydration of tissues due to estrogen, has antihypertensive effect in women c chronic hypertension, characteristic for the perimenopausal period, no effect on blood pressure in women with normal and hypotension, provides stable weight.

The purpose of the study is to improve the principles of preventing the loss and restoration of bone mineral density in women of perimenopausal period.

II. Materials and Methods

A comprehensive clinical and laboratory examination of 202 women of the perimenopausal period residing in the city of Tashkent was carried out, of which 103 (50.9%) women were isolated with a decrease in bone mineral density. According to the therapy methods, patients were divided into 2 groups. The main group (n=80) who were prescribed in the complex therapy (Ibadronate 150 mg, single dose per month, duration of treatment 6 months, as well as combination with preparation of calcium and vitamin D (500 mg of elemental calcium and 200 IU of cholecalciferol)) combined oral contraceptive (ethinyl estradiol 0.03 mg, drospirenone 3 mg) and 23 women who received therapy without COCs (comparison group). The control group consisted of 20 perimenopausal women with normal bone mineral density. The average age of women was 47±2.5 years. The survey was conducted for 18 months.

Author α σ: Department of Obstetrics and Gynecology, Tashkent Medical Academy, Tashkent, Uzbekistan. e-mail: author.uzb@mail.ru

The state of bone mineral density (BMD) of the lumbar vertebrae (L1-L4) and the proximal femur was evaluated based on ultrasound densitometry. The metabolic activity of bone remodeling processes was assessed by biochemical markers of bone remodeling such as formation markers (osteocalcin) and bone resorption (β-Crosslaps).

a) Statistical analysis

Comparison of groups of observations was made using a number of nonparametric statistics criteria (Pearson correlation, correlation coefficient) and Student's t-test using the statistical package SPSS 15.0, SYSTAT 11.

III. Results and Discussion

Data from numerous researchers was confirmed [6]: a large number of women showed a significant deviation in the nature of the menstrual cycle of the hypomenstrual type: hypomenorrhea in 30.1% of women; oligomenorrhea in 20.4% of women. Hypermenstrual type of menstrual dysfunction was also detected in a large number of women: polymenorrhea in 51 (49.5%) women. In women with a decrease in bone mineral density, menstrual disorders are presented with greater frequency than in women in the control group ($p<0.05$).

In the examined women, there was a high incidence of diseases contributing to the formation of secondary osteoporosis: the gastrointestinal-hepatic complex (in 46.6%); a history of neurological pathology: neurosis and neurosis-like states (100%); neuroendocrine syndrome was detected in 49.5%; thyroid dysfunction in history revealed in 30.1%.

The risk factors for the development of osteoporosis and the preliminary determination of the need for additional research methods have been identified. Minimal risk was detected in less than half of women (31.1%). According to testing, a high risk of osteoporosis was detected in 68.9% of women with a decrease in bone mineral density. The high risk of bone fracture, which is an extremely alarming factor, was hypothetically present in 34.9% of women. Based on the results of the study, prognostically unfavorable result was formed. In perimenopausal women, the minimal risk of osteoporosis was determined only in 31.1%. In 44.7%, a high risk of osteoporosis is hypothetically noted. In 21.4% of women, a high risk of not only low bone mineral density, but also fracture was hypothetically revealed. Thus, the study revealed the need to ascertain the state of bone mineral density in women of the late reproductive period for the prevention of the development of osteoporosis in the perimenopausal period.

An acute shortage of daily intake of calcium and vitamin D with food was also detected: daily calcium intake is performed only in 12 (11.7%), only 6 (5.8%) women receive a daily rate of vitamin D.

The bone mineral density of all women was verified at baseline and after 18 months of observation.

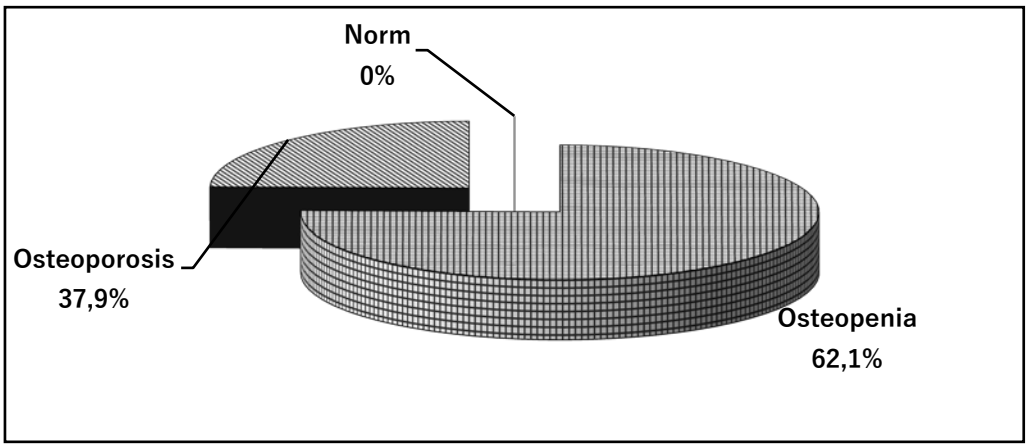

Fig. 1: The initial state of the bone tissue in women of the main group.

In women of the main group (Fig. 1), initial bone mineral density in 31 (38.8%) cases corresponded to osteoporosis, osteopenia was detected in 49 (61.2%) women. After a year of observation (Table 1), only 19 (23.8%) women had osteoporosis, which is 15% less than before treatment. Only in 51 (63.8%) women osteopenia was observed and in 10 (12.5%) cases bone mineral density corresponded to the norm.

On the background of complex therapy with the inclusion of oral combined contraceptives for 6 months, women not only did not decrease bone mineral density but also showed a tendency to its increase and stable state by the 12th month of observation. A statistically significant increase in bone mineral density in women of the main group ($p<0.01$) was noted. The beneficial effect of COC for 6 months on the state of mineral density, their ability to increase bone mineral density was revealed.

Table 1: The dynamics of the T-criterion in women of the main group (complex therapy with the inclusion of COC, n=80)

Study Time	Minimum	Maximum	M	Σ	M
Original	-2,30	1,50	-,7050	1,26052	,28186
After a year	-1,80	1,60	-,5500	1,22066	,27295

In the women of the comparison group (Table 2), osteoporosis was initially detected in 8 (34.8%) cases, and osteopenia in 15 (65.2%) cases. After a year of observation, osteoporosis was observed in 11 (47.8%) women, which is 13% higher than baseline data. Osteopenia was detected in 12 (52.2%) cases. Cases with normal indicators of bone mineral density were not detected. There was a significant decrease in bone mineral density in women of the comparison group for 6 months ($p < 0.01$).

Table 2: The dynamics of the T-criterion in women of the comparison group (without taking COCs, n=23)

Study Time	Minimum	Maximum	M	σ	M
Present	-2,80	1,80	-1,1850	1,30193	,29112
After a year	-3,50	1,50	-1,6000	1,26574	,28303

According to the study, changes in the bone resorption index of β-CrossLaps were observed in the dynamics of observation, depending on the type and duration of therapy.

In women of the main group (Table 3), there was a decrease in the level of β-CrossLaps after 1 month of COCs therapy ($r=0.52$ – medium correlation). By the third month of therapy, the β-CrossLaps indicator returned to baseline values; by the sixth, there was a tendency to decrease (with $r=0.57$, the average correlation).

Table 3: Dynamics of the level of β-CrossLaps, ng/ml in women of the main group (in patients receiving COCs)

Study Time	Minimum	Maximum	M	Σ	m
Present	,22	,65	,4619	,13151	,02941
After a month	,20	,55	,3200	,09399	,02630
After 3 months	,22	,41	,3063	,04862	,02422
After 6 months	,20	,57	,3407	,09859	,02724
After a year	,20	,55	,3353	,11025	,02465

Significant changes in the rate of change were observed between the results of the study after 1 and 6 months ($p<0.01$). That is, against the background of COCs, the rate of bone resorption decreases not only during therapy, but also over the next 6 months.

Women in the comparison group without the use of COCs (Table 4) showed an increase in bone resorption rates, starting from the 6th month, continuing to the 12th month of observation, which indicates a continued increased resorptive activity of the bone tissue after the completion of therapy without COCs for more 6 months.

Table 4: Dynamics of the level of β-CrossLaps, ng/ml in women of the comparison group (without taking COCs)

Study Time	Minimum	Maximum	M	Σ	M
Present	,14	,56	,2838	,10869	,02430
After a month	,45	2,01	,9786	,41711	,02815
After a trimester	,34	1,61	,8450	,34317	,02963
After 2 trimesters	,33	1,56	,6917	,39760	,03533
After a year	,12	,70	,2842	,13786	,03083

All groups of women showed a tendency to a low level of the bone formation marker - osteocalcin at baseline, significantly reacting to the deficiency of female sex hormones.

At baseline in women of the main group (Table 5), the level of osteocalcin corresponded to 9.7375±0.39149 ng/ml. The maximum value, 11.89 ng/ml, initially in the group corresponded to the lower limit of normal (11.0 ng/ml). After 1 month of treatment with COCs, a tendency to an increase in osteocalcin levels was noted. A significant increase in the index was observed between the results of the study after 1 and 6 months ($p<0.01$). Consequently, against the background of COCs, an improvement in bone formation was revealed, the maximum by the 6th month of therapy.

Table 5: Dynamics of the level of Osteocalcin, ng/ml in women of the main group (in patients receiving COCs)

	Minimum	Maximum	M	Σ	M
Present	5,35	11,89	9,7375	1,75079	,39149
After a month	6,04	30,50	13,7275	5,23536	,7825
After a trimester	7,85	32,40	18,4520	7,73216	, 9327
After 6 months	14,22	43,79	27,5640	7,87755	0,9418
After a year	16,58	45,34	32,2495	8,66377	1,93728

In women of the comparison group (Table 6), there was a tendency to a significant decrease in osteocalcin levels in comparison with the norm both from baseline and due to the lack of replacement therapy with COCs. Significant changes in the rate of change were noted between the results of the study after 6 months ($p<0.01$). Thus, with a rather low initial level of osteocalcin, a tendency to its decrease was noted, at most by the 6th month. After a year the completion of calcium and vitamin D supplements, the bone-up of osteocalcin was normal, however, in its lower range.

Table 6: Dynamics of Osteocalcin, ng/ml in women of the comparison group (without taking COCs)

	Minimum	Maximum	M	σ	M
Present	11,91	13,67	12,9110	,58862	,13162
After a month	7,20	35,00	15,7550	7,73791	,13284
After 3 months	6,50	30,20	12,9990	6,45318	,45710
After 6 months	3,75	11,76	7,1400	1,98844	,27012
After a year	5,35	17,25	12,7240	2,47147	,55264

Thus, as a result of the study in women of the perimenopausal period, the source of a low index of bone mineral density was revealed: osteoporosis in 37.8%, osteopenia in 62.2%. At the same time, the minimum risk of osteoporosis was observed in 34 (33%), a high risk of osteoporosis in 47 (45.6%), a high risk of bone fracture in 22 (21.3%).

The use of COCs in complex therapy led to a decrease in bone resorption, while in the group of women who did not use COCs; there was an increase in bone resorption rates, starting from the 6th month, continuing to the 12th month of observation, which indicates continued increased resorptive activity of bone tissue.

Initially, all women had low osteocalcin levels. Against the background of COCs, an improvement in bone formation was revealed, the maximum by the 6th month of therapy.

IV. Conclusion

1. In women with adverse factors of the menstrual, reproductive, somatic history in the perimenopausal period, there is a high incidence of the development of a pathological decrease in bone mineral density.
2. The use of combined oral contraceptives in the perimenopausal period contributes to the activation of bone remodeling processes.

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Uterine Rupture at 35 Weeks Gestational Age after Laparoscopic Myomectomy- A Case Report

By Dr. Karthiga Dhandapani, Dr. Valsa Diana G & Dr. Shyamala Madheswaran

Abstract- Laparoscopic myomectomy is a treatment option to preserve fertility and alleviate symptoms associated with fibroids. Although this procedure is reasonably expected to increase the risk of uterine rupture during pregnancy, reports on this issue are scarce. We are, hereby, reporting a case of second gravida who conceived within 2 months of laparoscopic myomectomy who presented with complaints of pain abdomen and decreased fetal movements at 35 weeks of gestational age. She was found to be in early shock with her abdomen tense and tender and was taken up for emergency cesarean section promptly. Every abdominal pain in pregnant women with scarred uterus should be carefully evaluated and properly examined to rule out rupture. Proper advice to the patients regarding the risks during pregnancy post myomectomy is a must.

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Uterine Rupture at 35 Weeks Gestational Age after Laparoscopic Myomectomy- A Case Report

Dr. Karthiga Dhandapani [α], Dr. Valsa Diana G [σ] & Dr. Shyamala Madheswaran [ρ]

Abstract- Laparoscopic myomectomy is a treatment option to preserve fertility and alleviate symptoms associated with fibroids. Although this procedure is reasonably expected to increase the risk of uterine rupture during pregnancy, reports on this issue are scarce. We are, hereby, reporting a case of second gravida who conceived within 2 months of laparoscopic myomectomy who presented with complaints of pain abdomen and decreased fetal movements at 35 weeks of gestational age. She was found to be in early shock with her abdomen tense and tender and was taken up for emergency cesarean section promptly. Every abdominal pain in pregnant women with scarred uterus should be carefully evaluated and properly examined to rule out rupture. Proper advice to the patients regarding the risks during pregnancy post myomectomy is a must.

I. Introduction

Uterine rupture is one of the most dreaded complications of childbirth with potentially grave consequences to the mother and fetus .It is known fact that the rate of uterine rupture increases in patients with previous scarred uterus in the form of previous cesarean sections, myomectomy and abortion with instrumentation. We are in an era of rising trend of myomectomy being performed in patients facing infertility or to alleviate menstrual symptoms. Laparoscopic myomectomy is generally preferred by the patients in view of early recovery and less post operative discomfort. The effects of laparoscopic myomectomy in the subsequent pregnancy is less studied. Here we report a case of spontaneous rupture of uterus at 35 weeks of gestation following laparoscopic myomectomy.

II. Case Report

A 30 years old, gravida 2 para 1 was referred to our hospital at 35 weeks of gestation with complaints of pain abdomen and loss of fetal movements for the past 6 hours. Patient had a previous vaginal delivery of a healthy male baby 4 years back. She had complaints of dysmennorhoea and heavy menstrual bleeding 3 years after the first childbirth. She underwent laparoscopic myomectomy at a private hospital for the same complaints and a fundal fibroid was removed. No mention was made as to whether the endometrium was opened or not and hence the scar was taken as an unknown scar. Patient was not aware of the fact that she was supposed to postpone her next pregnancy and became pregnant within 2 months of the surgery.

The antenatal period was uneventful till 35 weeks. She was admitted with complaints of pain abdomen and reduced fetal movements for the past 6 hours. There was no history of bleeding per vaginum. On examination, the patient was found to be in a state of early shock with tachycardia, pallor and cold extremities. The abdomen was found to be tense and tender. Fetal bradycardia was noted. Ultrasound revealed the absence of retro placental clots .Patient was taken up for emergency cesarean section suspecting uterine rupture.

On opening the abdominal cavity, massive hemoperitoneum of around 1.5 liters was found. A lower transverse uterine incision was made and an alive male baby of birth weight of 2.6kg was delivered with a 5 minute Apgar of 4. Fundal rupture of size 3*3 cm at the site of myomectomy was seen and placenta was found to be adherent around the scar site. There was active bleeding from the site of rupture. Leaving the placenta in situ hysterectomy was proceeded. The post operative period was uneventful.

Author α σ: (Consultant), Department of Obstetrics and Gynaecology, Rajiv Gandhi Government Women and Children Hospital, Puducherry, India.
Author ρ: (DGO DNB PG), Department of Obstetrics and Gynaecology, Rajiv Gandhi Government Women and Children Hospital, Puducherry, India. e-mail: cheenu2413@gmail.com

Figure 1: Post operative picture of uterus with the site of rupture marked with an arrow.

III. Discussion

This case has suggested two important issues namely:

1) Women with a history of previous laparoscopic myomectomy suffer from uterine rupture more than those who don't.
2) A short interval between myomectomy and pregnancy may affect the pregnancy outcome.

According to Centers of Disease Control and prevention[1], approximately 1 per cent of mortality is caused by uterine rupture. In a report from rural India, maternal mortality associated with uterine rupture was found to be around 30% (Chatterjee 2007)[2]. Uterine rupture can be broadly classified as primary or secondary rupture[3]. Primary rupture occurs in an unscarred uterus while secondary rupture occurs in a scarred uterus. Recent studies suggest that the incidence of rupture in a previous lower segment incision is 0.2-1.5% and in previous classical section is 4-9%. A recent review by Morimatasu et al[4] suggested that the rate of rupture after adenomyomectomy during pregnancy is 6.0% which is way much higher. There are many proposed reasons for this high incidence of rupture. The most plausible cause is that during laparoscopic myomectomy it is difficult to delineate exactly the border of the lesion due to a lack of sense of touch and deep sensation. This leads to leaving behind a portion of myoma near the scar site which further weakens the scar.

Although we are in an era of increasing trend of laparoscopic myomectomy, only six case publications including our present study have been published about uterine rupture in a case of previous laparoscopic myomectomy. The table below shows the comparision among the publications.

Table 1[5]: Characteristics of six cases of uterine rupture during pregnancy following myomectomy

Author et al (Year)	Age	Operative Method	Obs. Score	GA in Weeks	Uterine Bleeding	Outcome	Delivery Method
Suginami (2001)		Laparoscopic		32	+	Live birth	Emergency Cesarean
Wada (2006)	33	Laparoscopic	G0P0	30	-	Live birth	Emergency cesarean
Morimatsu (2007)	35	Laparoscopic	G1P1	28	-	Live birth	Emergency
Onishi (2011)	40	Laparotomy	G3P1	31	-	Live birth	Emergency
Yukari (2014)	42	Laparoscopic	G2P0	35	+	Live birth	Elective
Our case (2018)	30	Laparoscopic	G2P1	35	-	Live birth	Emergency

A study by Kim et al[6] about the comparision of obstetric outcomes after laparoscopic versus laparotomic myomectomy in 2013 concluded that rate of dehiscence is 1.85-4.9% after laparoscopic when compared to 0% after laparotomic myomectomy. A similar study by Tian et al in 2015 concluded the same.

A short inter-pregnancy interval was associated with increased risk of uterine rupture in patient with previous cesarean section. The same may hold good for myomectomy also. Case reports by Wada et al[7] and Morimatsu et al also has a short interval of 1 and 12 months respectively. Hence, it is wise to advise patients to plan pregnancy at least 18 months after myomectomy. To further support the previous studies, Bujold et al[8] demonstrated that inter delivery interval of more than 24 months decreased the rupture rates.

In the recent past, many studies are conducted to develop surgical procedures to conserve uterus for future pregnancy in patients with huge fibroids. Osada et al[9] recommends triple flap method of closure and have reported zero uterine rupture in the subsequent pregnancies whereas Huang et al[10] have described double flap method of closure after laparoscopic adenomyomectomy. Recent advances in the management of fibroid including MR guided Focussed Ultrasound Surgery[11,12] offer promising results.

In spite of these enormous advances, there is a still a lack of enough studies highlighting the adverse pregnancy outcomes in patients with previous laparoscopic myomectomy. Further reports must be evaluated to develop safe operative techniques and to establish guidelines about management of pregnancy post myomectomy.

IV. Conclusion

The present case study highlights that we should have a strong suspisicion of uterine rupture in patients with previous laparoscopic myomectomy. Patients should be explained the risks of short interval between surgery and pregnancy. Planning of conservative management of fibroid in reproductive age group should be done with caution.

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Ethical Approval: Not required

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Successful Management of Prematured Rupture of Membrane (PROM): A Case Report

By Saika Shaheed, Munima Haque & Rebeka Haider

Abstract- *Background:* Preterm rupture of membrane during pregnancy can lead to having excessive illness as well as morbidity for the mother and the unborn baby. Identification and management may present several complications, particularly in low-resource centers. A higher level of doubt is crucial in making a timely diagnosis in these cases.

Objectives: The study was to see if conservative management is a proper supervision procedure for premature rupture of membrane in preterm pregnancy.

Materials and Methods: A twenty five year old primigravida patient of 28 weeks pregnancy was admitted to a tertiary care hospital in the city on the identification of preterm PROM.

Results: The patient had a history of per vaginal watery discharge for 2 weeks. Perspeculum examination shows the liquor escaping out through the cervix, but the cervix was closed.USG of pregnancy profile showed viable single pregnancy of about 28 weeks. Conservative treatment was continued and at 32 weeks of pregnancy she complaint of severe lower abdominal pain, which was increasing in nature.

Keywords: *PROM, preterm labor, neonatal illness.*

GJMR-E Classification: *NLMC Code: WS 410*

Strictly as per the compliance and regulations of:

Successful Management of Prematured Rupture of Membrane (PROM): A Case Report

Saika Shaheed [α], Munima Haque [σ] & Rebeka Haider [ρ]

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Conclusion: This occurrence shows that premature rupture of membrane can be successfully taken care of by conservative management and delivering a healthy baby near term.

Keywords: PROM, preterm labor, neonatal illness.

I. Introduction

Premature rupture of membranes (PROM) can happen at term or subsequently before labor, otherwise can be an unanticipated difficulty through the preterm phase. PROM can be classified as term PROM (TPROM is PROM following gestation of 37 weeks), and preterm PROM (PPROM, that is PROM before gestation at 37 weeks). The pathophysiology directing to TPROM and PPROM are dissimilar. At TPROM, flagging of the membranes can happen due to physiological modifications merged including shear force stimulated by shrinkages. [1–4] Widespread flaw of the membranes are problematic for identification having PROM. [5] PPROM can occur due to a focal deficit instead by the membrane weakness. [6] TPROM difficulty occurs around 8% of all pregnancies. [7] Women who starts labor naturally about 50% of them by 12, 70% by 24, 85% by 48, and 95% by 72 hours. [7–9] TPROM linked to fetal illnesses consist of soaring infection and in utero cord compression. [7] Maternal hazards of TPROM are chorioamnionitis and postpartum febrile illness. [7, 9] PPROM, is a difficulty from 2% - 20% of entire deliveries, [10] is a recognized vital sponsor to maternal and perinatal illness and perinatal death. Dormancy in PPROM which is the time from PROM to birth, [7] is inversely linked to gestational age at rupture, related to fetus numbers, [11] oligohydramnios difficulty, [12] myometrial thickness, [13] and the presence of child birth or maternal difficulties. The vital reason of perinatal illness and death related to PPROM is prematurity. [7] Illnesses due to prematurity are interventricular hemorrhage, respiratory suffering symptoms, cerebral palsy, sepsis, and necrotizing enterocolitis. [7] Additional difficulties are in-utero umbilical cord compression, fetal distress, cord prolapse, placental abruption, fetalunusual position at delivery time, chorioamnionitis following endometritis, and hazards of delivery by operation. [7] For over seven decades, there has been debate amid healthcare experts regarding the ideal method to clinical examination and identification of PROM. Mostly membrane rupture may be established by documenting amniotic fluid leak from the cervical os in the posterior vaginal fornix assembly. [14]

PPROM happens in about 3% of entire pregnancies and is accountable for 33% of entire preterm births. PPROM influences 120 thousand pregnancies in the USA every year. The identification of PPROM is obtained through a blend of experimental doubt, history of patient and couple of examinations. PPROM is linked to substantial maternal and neonatal illness and death by infection, placental abruption, preterm birth, and umbilical cord compression. The positive cultures rate provided by trans-abdominal amniocentesis with PPROM without labor is 25% to 40%.The best duration for delivery happens in PPROM when the dangers of immaturity are offset due to the hazards of pregnancy preservation. Age at gestation related to cure is vital and ought to be regulated by neonatal intensive care unit (NICU) in every hospital. Antenatal antibiotics and corticosteroid therapies have pure advantages to women exclusive of condition

Author α ρ: Dhaka Central International Medical College and Hospital, Dhaka, Bangladesh.
Author σ: Research Fellow, Relevant Science & Technology Society, Bangladesh. e-mail: munima.haque@gmail.com

making the treatment risky. Women are supervised carefully for labor, infection, placental abruption, as well as anun-encouraging fetal condition in conservative management. Women having PPROM after gestation at 32 weeks must be considered for delivery, and the advantages of delivery obviously compensate the dangers after 34 weeks.

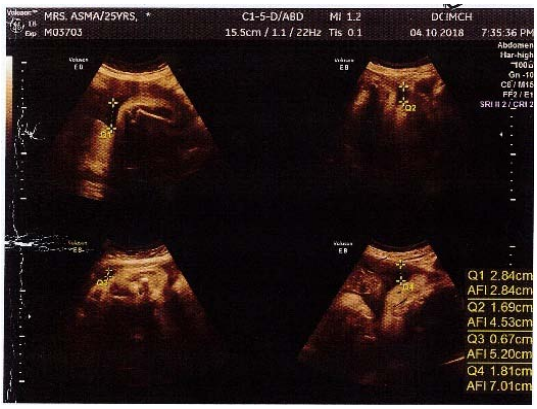
PROM identification is problematic if there is a sluggish liquid leakage or bleeding, or if the normal liquid flow does not happen. [15] Also, the comparatively small quantity of amniotic fluid found in initial in gestation tests the identification of ruptured membranes. [16] It is seen that even proceeding 34 weeks in pregnancy, speculum exam for conception of amniotic fluid gives a12% false negative without presence of fluid. [17] A "two sac" theory of membrane rupture was given in 1951. [18] Rupture of membranes is not totally clear in around 20% to 25% of cases. [19] Early and precise identification of membrane rupture could permit forage at gestation particular interference to enhance perinatal result as well as minimizing severe difficulties. [20] A precise biochemical marker intended for membrane rupture must possess a low maternal blood concentration, a high amniotic fluid concentration, also a short background cervicovaginal discharge concentration having intact membranes. [21]

There are not many documents reported for preterm rupture of membrane in Bangladesh. As it has been an important issue to understand and the urgency to detect PPROM at an early stage and also its proper diagnosis, cases must be reported to overcome the limitations of early successful detection and treatment. The objective of this study was to diagnose a PROM case and to provide proper treatment as well as prevention of subsequent complications. The reason for this study was to review the consequence of infant delivered after spontaneous rupture of membrane at 28 weeks' gestation.

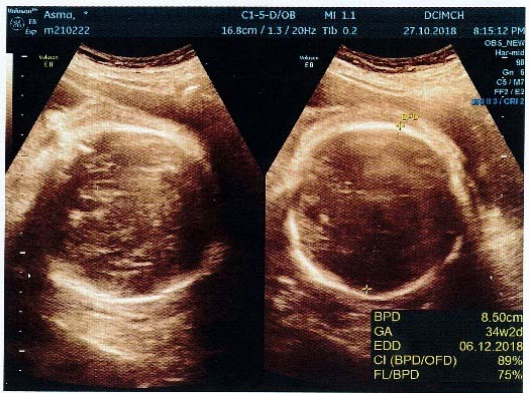
II. Case Report

This is a case study which was carried out at a modern tertiary care hospital, Dhaka Central International Medical College and Hospital, Dhaka, after taking approval of the institutional ethical committee. The patient was selected for this study after reporting liquor escaping from her vagina and went through proper treatment and recovery. Routine examinations were performed as well as regular monitoring was done by the surgeon on the patient.

Mrs. A, a primigravida patient having 28 weeks of pregnancy have a history of per vaginal watery discharge for 2 weeks. She conceived after 7 years of married life by ovulation induction drug. She had history of hypothyroidism and Gestational diabetes mellitus, and was on Insulin. She had no history of fever and abdominal pain. Perspeculum examination shows the liquor escaping out through the cervix, but the cervix was closed. Then she was shifted from a hospital from district Comilla to a tertiary care center Dhaka Central International Medical College and Hospital, Dhaka immediately for better management. Some investigations were send like CBC, C-reactive protein (CRP), Blood sugar, HbA1c, Urine R/M/E and USG of pregnancy profile then started injectable antibiotics and other hormonal supports. Her Hb% was 10.2 g/dl, CRP 12 mg/L (which was within normal limit), urine R/M/E was normal, but her HbA1C level was 9.6%, FBS 8.1 mmol/L, 2 HABF 11.3 mmol/L. Then gradually increasing her insulin dose USG of pregnancy profile showed viable single pregnancy of about 31+ weeks with moderate oligohydramions. Her Amniotic fluid index (AFI) was 5.95 cm and foetal weight 1656 gm (± 24 grams). High vaginal swab (HVS) was sent for culture, which reported nothing significant. After admission her blood sugar level was controlled day by day by increasing insulin. But she still complained of per vaginal watery discharge, which continuously happened. So, CRP was repeated and USG of pregnancy profile was done to see foetal weight and AFI level. But her CRP was always normal limit. On USG, AFI level was also within normal level. She never complained of lower abdominal pain. So, conservative treatment was continued and in the meantime Oradexon dose was completed for lung maturation of the baby. At 32 weeks of pregnancy she complaint of severe lower abdominal pain, which was increasing in nature. After per vaginal examination, cervix was 6 cm dilated. Then patient was taken to operation theatre for emergency caesarean section. A healthy female baby was delivered, the baby cried immediately, and baby weight was 2.7 kg.



(a)



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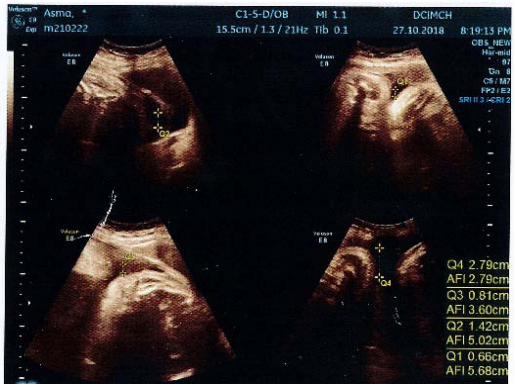

(c)

Figure 1: (a) shows USG of 31 weeks of full pregnancy, (b) and (c) at 33 weeks of pregnancy profile.

After operation both mother and baby were in good health. After post operation, the newborn was kept in NICU support for 7 days. The baby did not have infection. On the third day bilirubin level of baby was increased, phototherapy was given. The patient and the baby were discharged at fifth post-operative day (POD).

III. Discussion

a) Examination and assessment

PPROM analysis is formulated through clinical doubt, history of patient and examination. History of patient has a 90% precision for the identification of PPROM. [23] Two examinations have been endorsed for the analysis of PPROM: Nitrazine paper testing and also ferning testing on the vaginal pool. It was concluded that if a blend of history of patient, ferning, and nitrazine testing are utilized to examine a patient diagnosing for PROM, the precision of minimum 2 affirmative examinations was 93.1%. [23] The ferning test ought to be done on mid-vaginal or rear-end fornix fluid; pollution with mucus from cervix may trigger an erroreous positive outcome. [24] The existence of bacterial vaginosis, alkaline urine, cervicitis, semen, soap, antiseptic liquids, and blood was discovered to modify the nitrazine test, mostly giving false positive outcomes. [24, 25] A digital cervical inspection must be shunned during examination and assessment of PPROM. Digital cervical examination has been linked to the sterile speculum test and concluded that inactivity was decreased substantially utilizing cervical exam for all ages at gestation. [26]

b) Infection

There are various risk factors that can be linked to PPROM. They are: excessive collagen degradation and membrane stretch, placental abruption, localized membrane flaws, advanced automated death of amniotic cell, and choriodecidual infection. [22, 23, 28, 29] Prior to 32 weeks of gestation, expectant management is chosen whenever probable to reduce the dangers of premature delivery. Proceeding gestational age of 32 weeks, the occurrence of substantial neonatal illness as well as death reduces drastically. A project showed the rate for survival of children delivered proceeding gestational age of 32 weeks surpassed 96% while rates for survival enhanced by less than 1% weekly afterwards. [30] The resultant assessment of perinatal illness for this same patient group shown that the occurrence and gravity of respiratory suffering pattern gradually reduced by means of rising gestational age past 36 weeks of gestation. [31] Neonatal problems having possibility of prolonged condition are infrequent after gestation at 34 weeks. These studies reveal the dangers of harmful neonatal consequence linked to preterm deliveries from all reasons. [32] PPROM is capable of upsetting 4.5% of total pregnancies. [33, 34] From 60% to 80% women that have their membrane ruptured before term would deliver by 7 days. [33, 34] PPROM explains for 40% to 50% of preterm births [35, 36] and is related to an elevated proportion of neonatal illness than gestational age related idiopathic preterm labor. [37]

c) Risk factors

Multiple etiologic danger features for PPROM are proposed, e.g. socioeconomic status, ethnicity, nutrition, and smoking. [34, 38] Epidemiological data have shown that cervical issue, vaginal bleeding, multi-fetal pregnancies, poor obstetric history, preexisting medical conditions, and genital tract infections [34] are linked to PPROM. Trouble-free uterine action that creates modification and dilation of the cervix, having secondary PPROM is a frequently neglected possible reason. [36] Having a PPROM history substantially elevates the danger in a succeeding pregnancy, [39] and chorioamnionitis has been found for 24% to 30% patients having PPROM during rupture. [36, 40] The membranes rupture mechanism is not known, said to be directly linked to the membrane collagen. [35, 38] An elevation in the ratio of matrix metalloproteinase to tissue inhibitors of matrix metalloproteinase due to disorders in connective tissue or poor nutrition has been stated to be the reason .[35, 41-43]

d) Supervision

PPROM happening before gestation ought to be expectant supervision [44, 45] due to the substantial neonatal morbidity linked to prematurity upto 34 weeks of gestation. The best supervision of women that stay undelivered one week after membrane rupture, who attain gestation at 34 weeks, and who have membrane ruptures after 34 weeks is still debatable. [46-50] Supervision of women having PPROM prior to gestation at 34 weeks normally consists of reference to a tertiary care hospital owing to the preterm birth risk, one course of corticosteroid administration, [51] tocolysis for transfer or'corticosteroid administration, [52] broad spectrum antibiotic therapy, [53, 54] and probable outpatient supervision. [55] Clinical supervision of women from 34 to 37 weeks' gestation remains debatable. [55, 56] Active supervision in this interval involves instant initiation of labor, with the possible hazard of prematurity necessitating NICU supervision. Expectant management can extend pregnancy but can elevate the risk of chorioamnionitis [57] having related maternal, fetal, and neonatal consequences. [58]

e) Therapeutic involvement

Therapy has been endeavored after PPROM using cryoprecipitate injected into the amniotic cavity and autologous platelets, having changeable outcomes in minor analyses; additionally amniotic membranes "Laser welding" throughout fetoscopy is in the investigational phase. [60] Given the insensitivity and questionable usefulness of involvements proceeding PPROM, more effort is needed into primary prevention and research intended to improve neonatal outcomes. Current epidemiological results, [61, 62] which are reinforced by animal experiments, [63] suggest in utero infection to be a key danger feature in case of the growth of perinatal brain injury. More research for PPROM and the related danger of perinatal brain injury are needed. [64]

IV. Conclusion

PPROM is linked to considerable maternal illness and neonatal illness and death. Healthcare prices are drastically increased due to long term stay at hospital, the requirement of recurrent analysis and the subsequent neonatal price for newborn due to long lasting neonatal intensive care. Management necessitates a precise examination and age at gestation finding. A gestational age method to cure is vital which ought to be regulated for each case. Corticosteroid treatments and antenatal antibiotics have well-defined advantages and must be accessible for all women not having contraindications. Women ought to be supervised carefully in conservative management for labor, infection, a non-reassuring fetal stage, and placental abruption. PPROM patients must be deliberated for delivery of gestation after 32 weeks, and the advantages of optional delivery seem to compensate the dangers after 34 weeks.

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None

Conflict of interest
There is none.

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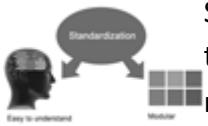
We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The FARSM can go through standards of OARS. You can also play vital role if you have any suggestions so that proper amendment can take place to improve the same for the benefit of entire research community.

As FARSM, you will be given a renowned, secure and free professional email addres with 100 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.



The FARSM will be eligible for a free application of standardization of their researches. Standardization of research will be subject to acceptability within stipulated norms as the next step after publishing in a journal. We shall depute a team of specialized research professionals who will render their services for elevating your researches to next higher level, which is worldwide open standardization.

The FARSM member can apply for grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A. Once you are designated as FARSM, you may send us a scanned copy of all of you credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria. After certification of all your credentials by OARS, they will be published on your Fellow Profile link on website https://associationofresearch.org which will be helpful to upgrade the dignity.

The FARSM members can avail the benefits of free research podcasting in Global Research Radio with their research documents. After publishing the work, (including published elsewhere worldwide with proper authorization) you can upload your research paper with your recorded voice or you can utilize chargeable services of our professional RJs to record your paper in their voice on request.

The FARSM member also entitled to get the benefits of free research podcasting of their research documents through video clips. We can also streamline your conference videos and display your slides/ online slides and online research video clips at reasonable charges, on request.

The FARSM is eligible to earn from sales proceeds of his/her researches/reference/review Books or literature, while publishing with Global Journals. The FARSS can decide whether he/she would like to publish his/her research in a closed manner. In this case, whenever readers purchase that individual research paper for reading, maximum 60% of its profit earned as royalty by Global Journals, will be credited to his/her bank account. The entire entitled amount will be credited to his/her bank account exceeding limit of minimum fixed balance. There is no minimum time limit for collection. The FARSM member can decide its price and we can help in making the right decision.

The FARSM member is eligible to join as a paid peer reviewer at Global Journals Incorporation (USA) and can get remuneration of 15% of author fees, taken from the author of a respective paper. After reviewing 5 or more papers you can request to transfer the amount to your bank account.

MEMBER OF ASSOCIATION OF RESEARCH SOCIETY IN MEDICAL (MARSM)

The ' MARSM ' title is accorded to a selected professional after the approval of the Editor-in-Chief / Editorial Board Members/Dean.

The "MARSM" is a dignified ornament which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., MARSM or William Walldroff, M.S., MARSM.

MARSM accrediting is an honor. It authenticates your research activities. Afterbecoming MARSM,you can add 'MARSM' title with your name as you use this recognition as additional suffix to your status. This will definitely enhance and add more value and repute to your name. You may use it on your professional Counseling Materials such as CV, Resume, Visiting Card and Name Plate etc.

The following benefitscan be availed by you only for next three years from the date of certification.

MARSM designated members are entitled to avail a 25% discount while publishing their research papers (of a single author) in Global Journals Inc., if the same is accepted by our Editorial Board and Peer Reviewers. If you are a main author or co-author of a group of authors, you will get discount of 10%.

As MARSM, you willbe given a renowned, secure and free professional email address with 30 GB of space e.g. johnhall@globaljournals.org. This will include Webmail, Spam Assassin, Email Forwarders,Auto-Responders, Email Delivery Route tracing, etc.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time.This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

The MARSM member can apply for approval, grading and certification of standards of their educational and Institutional Degrees to Open Association of Research, Society U.S.A.

Once you are designated as MARSM, you may send us a scanned copy of all of your credentials. OARS will verify, grade and certify them. This will be based on your academic records, quality of research papers published by you, and some more criteria.

It is mandatory to read all terms and conditions carefully.

AUXILIARY MEMBERSHIPS

Institutional Fellow of Open Association of Research Society (USA) - OARS (USA)

Global Journals Incorporation (USA) is accredited by Open Association of Research Society, U.S.A (OARS) and in turn, affiliates research institutions as "Institutional Fellow of Open Association of Research Society" (IFOARS).

The "FARSC" is a dignified title which is accorded to a person's name viz. Dr. John E. Hall, Ph.D., FARSC or William Walldroff, M.S., FARSC.

The IFOARS institution is entitled to form a Board comprised of one Chairperson and three to five board members preferably from different streams. The Board will be recognized as "Institutional Board of Open Association of Research Society"-(IBOARS).

The Institute will be entitled to following benefits:

The IBOARS can initially review research papers of their institute and recommend them to publish with respective journal of Global Journals. It can also review the papers of other institutions after obtaining our consent. The second review will be done by peer reviewer of Global Journals Incorporation (USA) The Board is at liberty to appoint a peer reviewer with the approval of chairperson after consulting us.

The author fees of such paper may be waived off up to 40%.

The Global Journals Incorporation (USA) at its discretion can also refer double blind peer reviewed paper at their end to the board for the verification and to get recommendation for final stage of acceptance of publication.

The IBOARS can organize symposium/seminar/conference in their country on behalf of Global Journals Incorporation (USA)-OARS (USA). The terms and conditions can be discussed separately.

The Board can also play vital role by exploring and giving valuable suggestions regarding the Standards of "Open Association of Research Society, U.S.A (OARS)" so that proper amendment can take place for the benefit of entire research community. We shall provide details of particular standard only on receipt of request from the Board.

The board members can also join us as Individual Fellow with 40% discount on total fees applicable to Individual Fellow. They will be entitled to avail all the benefits as declared. Please visit Individual Fellow-sub menu of GlobalJournals.org to have more relevant details.

We shall provide you intimation regarding launching of e-version of journal of your stream time to time. This may be utilized in your library for the enrichment of knowledge of your students as well as it can also be helpful for the concerned faculty members.

After nomination of your institution as "Institutional Fellow" and constantly functioning successfully for one year, we can consider giving recognition to your institute to function as Regional/Zonal office on our behalf.
The board can also take up the additional allied activities for betterment after our consultation.

The following entitlements are applicable to individual Fellows:

Open Association of Research Society, U.S.A (OARS) By-laws states that an individual Fellow may use the designations as applicable, or the corresponding initials. The Credentials of individual Fellow and Associate designations signify that the individual has gained knowledge of the fundamental concepts. One is magnanimous and proficient in an expertise course covering the professional code of conduct, and follows recognized standards of practice.

Open Association of Research Society (US)/ Global Journals Incorporation (USA), as described in Corporate Statements, are educational, research publishing and professional membership organizations. Achieving our individual Fellow or Associate status is based mainly on meeting stated educational research requirements.

Disbursement of 40% Royalty earned through Global Journals : Researcher = 50%, Peer Reviewer = 37.50%, Institution = 12.50% E.g. Out of 40%, the 20% benefit should be passed on to researcher, 15 % benefit towards remuneration should be given to a reviewer and remaining 5% is to be retained by the institution.

We shall provide print version of 12 issues of any three journals [as per your requirement] out of our 38 journals worth $ 2376 USD.

Other:

The individual Fellow and Associate designations accredited by Open Association of Research Society (US) credentials signify guarantees following achievements:

- The professional accredited with Fellow honor, is entitled to various benefits viz. name, fame, honor, regular flow of income, secured bright future, social status etc.

- In addition to above, if one is single author, then entitled to 40% discount on publishing research paper and can get 10%discount if one is co-author or main author among group of authors.
- The Fellow can organize symposium/seminar/conference on behalf of Global Journals Incorporation (USA) and he/she can also attend the same organized by other institutes on behalf of Global Journals.
- The Fellow can become member of Editorial Board Member after completing 3yrs.
- The Fellow can earn 60% of sales proceeds from the sale of reference/review books/literature/publishing of research paper.
- Fellow can also join as paid peer reviewer and earn 15% remuneration of author charges and can also get an opportunity to join as member of the Editorial Board of Global Journals Incorporation (USA)
- • This individual has learned the basic methods of applying those concepts and techniques to common challenging situations. This individual has further demonstrated an in–depth understanding of the application of suitable techniques to a particular area of research practice.

Note :

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- In future, if the board feels the necessity to change any board member, the same can be done with the consent of the chairperson along with anyone board member without our approval.
- In case, the chairperson needs to be replaced then consent of 2/3rd board members are required and they are also required to jointly pass the resolution copy of which should be sent to us. In such case, it will be compulsory to obtain our approval before replacement.
- In case of "Difference of Opinion [if any]" among the Board members, our decision will be final and binding to everyone.

"

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.

Before and during Submission

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

It is required for authors to declare all financial, institutional, and personal relationships with other individuals and organizations that could influence (bias) their research.

Policy on Plagiarism

Plagiarism is not acceptable in Global Journals submissions at all.

Plagiarized content will not be considered for publication. We reserve the right to inform authors' institutions about plagiarism detected either before or after publication. If plagiarism is identified, we will follow COPE guidelines:

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:

- Words (language)
- Ideas
- Findings
- Writings
- Diagrams
- Graphs
- Illustrations
- Lectures

- Printed material
- Graphic representations
- Computer programs
- Electronic material
- Any other original work

Authorship Policies

Global Journals follows the definition of authorship set up by the Open Association of Research Society, USA. According to its guidelines, authorship criteria must be based on:

1. Substantial contributions to the conception and acquisition of data, analysis, and interpretation of findings.
2. Drafting the paper and revising it critically regarding important academic content.
3. Final approval of the version of the paper to be published.

Changes in Authorship

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.

Copyright

During submission of the manuscript, the author is confirming an exclusive license agreement with Global Journals which gives Global Journals the authority to reproduce, reuse, and republish authors' research. We also believe in flexible copyright terms where copyright may remain with authors/employers/institutions as well. Contact your editor after acceptance to choose your copyright policy. You may follow this form for copyright transfers.

Appealing Decisions

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.

Declaration of funding sources

Global Journals is in partnership with various universities, laboratories, and other institutions worldwide in the research domain. Authors are requested to disclose their source of funding during every stage of their research, such as making analysis, performing laboratory operations, computing data, and using institutional resources, from writing an article to its submission. This will also help authors to get reimbursements by requesting an open access publication letter from Global Journals and submitting to the respective funding source.

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.

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.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

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.

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.

General style:

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.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- 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.

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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.

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.

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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.

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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.

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Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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