A COMPARATIVE STUDY OF SAFETY AND EFFICACY OF PROPHYLACTIC INSERTION OF DR.BURKE'S EVERY SECOND MATTERS-UTERINE BALLOON TAMPONADE (ESM-UBT) WITH I.M OXYTOCIN VS ONLY I.M OXYTOCIN FOR PREVENTION OF ATONIC PPH IN WOMEN.

BY

DR. D SANTHOSHI

In partial fulfilment of the requirements for the degree of

MASTER OF SURGERY OBSTETRICS AND GYNAECOLOGY

UNDER THE GUIDANCE OF

DR. RAJASRI.YALIWAL
MBBS, MS(OBG) FICOG
PROFESSOR
DEPARTMENT OF OBSTETRICS AND GYNAECOLOGY

BLDE (DEEMED TO BE UNIVERSITY)
SHRI B.M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTER ,VIJAYAPURA-586103, KARNATAKA
2025

B.L.D.E. (DEEMED TO BE UNIVERSITY)

SHRI B .M PATIL MEDICAL COLLEGE
HOSPITAL & RESEARCH CENTRE,
VIJAYAPURA-586103, KARNATAKA

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Dr. D SANTHOSHI

Post Graduate Resident

Department of Obstetrics and Gynaecology

BLDE (Deemed to be University)

Shri B. M. Patil Medical College,

Hospital & Research Centre

Vijayapura-586103, Karnataka

B.L.D.E. (DEEMED TO BE UNIVERSITY)

SHRI B .M PATIL MEDICAL COLLEGE
HOSPITAL & RESEARCH CENTRE,
VIJAYAPURA-586103, KARNATAKA

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This is to certify that the dissertation entitled "**A COMPARATIVE STUDY OF SAFETY AND EFFICACY OF PROPHYLACTIC INSERTION OF DR.BURKE'S EVERY SECOND MATTERS-UTERINE BALLOON TAMPONADE (ESM-UBT) WITH I.M OXYTOCIN VS ONLY I.M OXYTOCIN FOR PREVENTION OF ATONIC PPH IN WOMEN.**" is a bonafide research work done by **Dr. D SANTHOSHI** in partial fulfilment of the requirement for the degree of Master of Surgery in Obstetrics and Gynaecology.

Dr RAJASRI G YALIWAL
Professor
Department of Obstetrics and Gynaecology
BLDE (Deemed to be University)
Shri B. M. Patil Medical College,
Hospital & Research Centre
Vijayapura-586103, Karnataka

B.L.D.E. (DEEMED TO BE UNIVERSITY)

SHRI B .M PATIL MEDICAL COLLEGE HOSPITAL & RESEARCH CENTRE, VIJAYAPURA-586103, KARNATAKA

ENDORSEMENT BY THE HEAD OF DEPARTMENT

This is to certify that this dissertation titled "**A COMPARATIVE STUDY OF SAFETY AND EFFICACY OF PROPHYLACTIC INSERTION OF DR.BURKE'S EVERY SECOND MATTERS-UTERINE BALLOON TAMPONADE (ESM-UBT) WITH I.M OXYTOCIN VS ONLY I.M OXYTOCIN FOR PREVENTION OF ATONIC PPH IN WOMEN"** is a bonafide work done by **Dr.D SANTHOSHI, under** overall guidance and supervision of **Dr. RAJASRI G YALIWAL** Professor**,** Departmentof Obstetrics and Gynaecology ,SHRI B M Patil Medical College Hospital and Research Centre, in partial fulfilment of the requirement for the degree of M. S. in Obstetrics and Gynaecology, examination to be held in 2023.

Dr. (Prof.) SHAILAJA R BIDRI
Professor and Head of the Deparment
Department of Obstetrics and Gynaecology
BLDE (Deemed to be University)
Shri B. M. Patil Medical College,
Hospital & Research Centre
Vijayapura-586103, Karnataka

B.L.D.E. (DEEMED TO BE UNIVERSITY)

SHRI B .M PATIL MEDICAL COLLEGE
HOSPITAL & RESEARCH CENTRE,
VIJAYAPURA-586103, KARNATAKA

ENDORSEMENT BY THE PRINCIPAL

This is to certify that the dissertation entitled **"A COMPARATIVE STUDY OF SAFETY AND EFFICACY OF PROPHYLACTIC INSERTION OF DR.BURKE'S EVERY SECOND MATTERS-UTERINE BALLOON TAMPONADE (ESM-UBT) WITH I.M OXYTOCIN VS ONLY I.M OXYTOCIN FOR PREVENTION OF ATONIC PPH IN WOMEN"** is a bonafide research work done by **Dr.D SANTHOSHI** under the guidance of **Dr.RAJASRI G YALIWAL,** Professor**,** Department of Obstetrics and Gynaecology, Shri B M Patil Medical College Hospital & Research Centre, Vijayapura, Karnataka in partial fulfilment of the requirement for the degree of Doctor in Surgery in Obstetrics and Gynaecology, examination to be held in 2024.

Dr. ARAVIND V PATIL
M.S (General surgery)
BLDE (Deemed to be University)
Shri B. M. Patil Medical College,
Hospital & Research Centre
Vijayapura-586103, Karnataka

B.L.D.E. (DEEMED TO BE UNIVERSITY)

SHRI B .M PATIL MEDICAL COLLEGE
HOSPITAL & RESEARCH CENTRE,
VIJAYAPURA-586103, KARNATAKA

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Dr. D SANTHOSHI
Post Graduate Resident
Department of Obstetrics and Gynaecology
BLDE (Deemed to be University)
Shri B. M. Patil Medical College,
Hospital & Research Centre
Vijayapura-586103, Karnataka

ACKNOWLEDGEMENT

I take this opportunity to extend my sincere gratitude and whole hearted thanks to all those who helped me to complete this dissertation.

First and foremost, I would like to express my deep sense of gratitude and indebtedness to my respected teacher and guide, **DR. RAJASRI G YALIWAL M.S(OBG), FICOG, Professor, Department of OBG**, SHRI B.M. PATIL MEDICAL COLLEGE for her invaluable guidance, care and input for bettering this project and investing time and energy to help for my personal and professional growth. Undoubtedly,this has equipped me with a sound knowledge of the subject of Obstetrics and Gynecology, which has enabled me to successfully complete this dissertation.

I am forever grateful to, **DR. SHAILAJA R BIDRI M.D, D.G.O.,** Professor andHead of the Department of Obstetrics and Gynecology, for imparting a wealth ofknowledge and life lessons that I will carry with me into all aspects of my personal and professional life for the valuable lessons about patient care and hospital practices that haveplayed a major role and contributed to the completion of this project.

I am indebted to all my lovely teachers who have patiently imparted their

wisdomand clinical teachings to me. There are no words to express my gratitude to Dr. **S.R. Mudanur, Dr. Neelamma Patil, Dr. Shobha Shiragur, Dr. Aruna Biradar, Dr. Shreedevi Kori, Dr Laxmi Sangoli, Dr.Basavaraj Patil, Dr Preeti Malapure , Dr. Shilpa Lakshmi, Dr. Amreen Bijapure .** I am also thankful to **Dr. Rajesh Honnutagi and Dr. Vijaykumar Kalyanappagol,** Medical Superintendents at Shri B.M. Patil Medical College Hospital and Research Centre, Vijayapura. Without their valuable knowledge, this project would have been difficult to complete.

I am extremely grateful to **DR. ARAVIND PATIL MD, Principal,** SHRI B.M. PATIL MEDICAL COLLEGE for his valuable co-operation and his willingness to alwaysbe available to assist any problem faced throughout the process of writing this dissertation

I thank my statistician, **Mr,murugesh mathpathi** for his aid and invaluable help concerning the statistical work for this study.

I would like to thank my seniors Dr. Swati Talwade and Dr. Namita Gupta for their guidance .Last but not least, I express my heartful gratitude to my family and my Co-PGs Dr Annapurna, Dr Shalini Nallaballe, Dr Sharanabasava Kulkarni, Dr Nirupa Ramachandran, Dr Sai Meghana, Dr Yamini, Dr Shravanthi Swamy, Dr Renukanandan Patil, Dr Vaishnavi Unni, Dr Rakshitha, Dr Keerthi Vadlamudi, Dr Aparna Patil, Dr Lavanya, Dr Shabana

Guddad and My Fellow Junior Residents and Interns.

I would like to thank my parents, **DANTAPURAM GANGADHAR and DANTAPURAM SUNITHA** for their valuable teachings, life lessons, love, support, patience, motivation and countless sacrifices. I am at this stage because of your support. I extend my thanks to my loving sibling **DANTAPURAM SHASHIDHAR,** my sister in law **DANTAPURAM YASHASWINI** and my daughter in law **DANTAPURAM YASHNA** for their constant support in motivating me throughout this journey of writing my dissertation. My special thanks to **DR P SAMVIDHAN REDDY** for his constant for giving me the confidence and strength to endure all the toils and turmoil in life and still remain strong. Thank you for everything. Finally, I bow my head in a silent acknowledgement of all thatThe Lord Almighty has blessed me with

Dr D SANTHOSHI

Post Graduate Resident

Department of Obstetrics and

BLDE (Deemed to be University)

Shri B. M. Patil Medical College,

Hospital & Research Centre

Vijayapura-586103, Karnataka

Gynaecology

ABBREVATIONS

S.NO	ABBREVATION	EXPANSION
1	PPH	POST PARTUM HEAMORRHAGE
2	MMR	MATERNAL MORTALITY RATIO
3	ACOG	AMERICAN COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS
4	FIGO	INTERNATIONAL FEDARATION OG GYNAECOLOGY AND OBSTETRICS
5	WHO	WORLD HEALTH ORGANIZATION
6	UBT	UTERINE BALLOON TAMPONADE
7	PIH	PREGNANCY INDUCED HYPERTENSION
8	ESM-UBT	EVERY SECOND MATTERS-UTERINE BALLOON TAMPONADE
9	HB	HAEMOGLOBIN
10	ADH	ANTIDIURETIC HORMONE
11	FHR	FETAL HEART RATE
12	CMS	CENTIMETERS
13	GDM	GESTATIONAL DIABETES MELLITUS
14	SD	STANDARD DEVIATION
15	IQR	INTERQUARTILE RANGES

LIST OF CONTENTS

LIST OF PICTURES

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Title:

A comparative study of safety and efficacy of prophylactic insertion of Dr.Burke's every second matters-uterine balloon tamponade (ESM-UBT) with I.M Oxytocin vs. only I.M Oxytocin for prevention of atonic PPH in women at risk of uterine atony: Randomised parallel group trial.

Background: Postpartum hemorrhage (PPH) remains a main cause of maternal mortality in the world, specially in low-resource settings. Uterine atony, the most common cause of PPH, often requires rapid and effective management to prevent life-threatening complications. While intramuscular (IM) oxytocin is the first-line intervention, cases unresponsive to uterotonics necessitate additional measures. Uterine balloon tamponade (UBT) has emerged as a minimally invasive and cost-effective technique for managing atonic PPH. This study evaluates the safety and efficacy of prophylactic use of Dr. Burke's Every Second Matters-Uterine Balloon Tamponade (ESM-UBT) combined with IM oxytocin versus IM oxytocin alone in preventing atonic PPH among women at high risk.

Methods: This randomized parallel-group trial was conducted over 1.5 years at Shri B.M. Patil Medical College, Hospital, and Research Centre, Vijayapura. A total of 226 women with high-risk pregnancies for atonic PPH were enrolled and randomized into two groups: Group 1 received prophylactic ESM-UBT with IM oxytocin (10 units), while Group 2 received only IM oxytocin. Blood loss was measured using the BRASS V drape and additional gauze pad weight

assessment. Hemoglobin levels were recorded pre-delivery and 48 hours postpartum. Analysis was performed using a software SPSS version 20.

Results: The prophylactic use of ESM-UBT significantly reduced total blood loss (median: 120 mL vs. 320 mL, $p < 0.01$) and post-delivery hemoglobin drop (Group 1: 9.9 g/dL vs. Group 2: 9.2 g/dL, $p = 0.0049$). Blood loss at 5, 10, and 60 minutes postpartum was consistently lower in the ESM-UBT group ($p < 0.0001$). The requirement for additional uterotonics and blood transfusion was significantly higher in the IM oxytocin-only group ($p = 0.002$, $p = 0.013$, respectively).

Conclusion: Prophylactic ESM-UBT significantly reduces blood loss and the need for additional interventions in high-risk women, demonstrating its potential as a vital tool in PPH prevention, particularly in resource-limited settings. Its cost-effectiveness and ease of use make it a feasible solution for improving maternal outcomes globally.

INTRODUCTION

Postpartum haemorrhage (PPH) is the emerging cause of maternal mortality in the world, occurring in roughly 1% to 3% of all deliveries. 127,000 deaths of mothers annually as reported by the “World Health Organization” (WHO).[1,2]

As of 2020, maternal deaths accounted for over 7% of fatalities among women aged 15 to 29. This makes maternal deaths a substantial cause of death for women. India current “maternal mortality ratio” (MMR) is at 97 deaths per 100,000 live birth. In India, postpartum haemorrhage (PPH) is the primary cause of mother mortality, contributing to 19.9% to 38% of all maternal fatalities each year.[3,4]

Many PPH patients can be successfully treated with low-cost methods like uterotonics and aggressive management of the third stage of labour. High-resource surgical procedures including uterine artery ligation, B-lynch sutures, or hysterectomy, however, can be required in refractory situations.[5,6]

In India, uterine atony is the most common cause of postpartum haemorrhage (PPH), which is reported to occur 2% to 4% after vaginal delivery and 6% after caesarean section.[7]

Postpartum hemorrhage is any quantity of bleeding from or into the genital tract after birth that lasts until the end of the the puerperium and negatively impacts the patient's overall health, as shown by an increase in pulse rate and a decrease in blood pressure. The “World Health Organization” (WHO) has the most widely used definition, defining PPH as 500 ml or more of bleeding within twenty-four hours of birth through the vaginal canal and 1000 ml or more of blood loss following a cesarean delivery. The “American College of Obstetricians and Gynaecologists” (ACOG) revised their definition of PPH to include "blood loss with signs or symptoms of hypovolemia or blood loss greater than or equal to 1000 ml." [8,9]

Uterine atony is found to be one of the top 5 reasons of maternal deaths in the world.[10] It is commonly recorded as the majority of deaths occurs within the

first 24 hours after birth, and the postpartum haemorrhage (PPH), is reason and up to one-fourth of maternal deaths. Mothers may have a hysterectomy or other life-saving treatments even if they survive severe bleeding, which could have significant effects on their quality of life and future ability to reproduce.[11,12]

Despite advancements in obstetric care, PPH continues to pose a severe and potentially life-threatening risk to women globally. A very successful non-surgical treatment for refractory atonic PPH is uterine balloon tamponade (UBT). [13,14]

Because UBT has been shown to improve survival from atonic PPH, both the "World Health Organization (WHO) and FIGO (the International Federation of Gynaecology & Obstetrics)" recommend therapy for refractory patients.

Commercial UBT devices are extremely expensive in low- and middle-income countries, where they might have the most impact. To address this problem, Massachusetts General Hospital's "Global Health Innovation Laboratory "developed the incredibly affordable Every Second Matters UBT (ESM-UBT) device and container. ESM-UBT has been shown to be safe and effective in managing refractory, atonic PPH in a few low- and middle-income countries.[15]

Prophylactic insertion of Dr. Burke's Every Second Matters-Uterine Balloon Tamponade (ESM-UBT) in conjunction with intramuscular oxytocin, as compared to oxytocin alone, has been reported to be more effective and safer in preventing atonic postpartum haemorrhage (PPH) among the women who are at risk of uterine atony. A mechanical and pharmacological synergy between ESM-UBT and oxytocin efficiently reduces bleeding, lowers the chances of critical haemorrhage, and lessens the need for intrusive methods. This approach offers a financially viable and life-saving way to treat and prevent atonic PPH, which is especially important in low-resource environments where prompt access to cutting-edge surgical care may be restricted.

This study aims to compare the safety and efficacy of prophylactic insertion of Dr.Burke's every second matters-uterine balloon tamponade (ESM-UBT) with

I.M Oxytocin vs. only I.M Oxytocin for prevention of atonic PPH in women at risk of uterine atony.

AIM & OBJECTIVES

AIM OF THE STUDY:

A comparative study of safety and efficacy of prophylactic insertion of Dr.Burke's Every Second Matters-Uterine Balloon Tamponade (ESM-UBT) with I.M Oxytocin vs. only I.M Oxytocin for prevention of atonic PPH in women at risk of uterine atony.

OBJECTIVES

1. PRIMARY OUTCOME:

1. To compare the blood loss in women in which UBT with I.M oxytocin was used to those in whom only I.M oxytocin is used.

2. SECONDARY OUTCOME:

2. To assess the safety of UBT
3. To study the adverse effects of using UBT
4. To assess the need for uterotonic drugs
5. To assess the need for surgical intervention

REVIEW OF LITERATURE

Postpartum haemorrhage (PPH)

Postpartum haemorrhage (PPH), which is defined by substantial blood loss following delivery, is a serious health concern to mothers. Although the coagulation cascade and uterine contractions largely control blood loss, PPH can cause serious problems if left not managed. More thorough criteria that reflect hypovolemia symptoms have been added to the traditional description of PPH, which relied on blood loss thresholds. The conventional definitions of PPH are more than 500 milliliters of anticipated blood loss with the delivery via the vagina or in excess of 1000 milliliters of projected blood loss following a cesarean delivery.[16,17]

TYPES OF PPH:

1. **Primary postpartum hemorrhage-** Within the initial 24 hours following delivery, primary or immediate PPH develops. Uterine atony causes about 70% of cases of acute PPH. The failure of the uterus to adequately contract when the baby is born is known as atony of the uterus.
2. **Secondary postpartum hemorrhage**- PPH that develops between 24 hours after the baby is delivered and 6 weeks postpartum is referred to as secondary or late PPH.

ETIOLOGY OF PPH:

PPH is mainly caused by the four "T's": “tone (uterine atony), trauma (lacerations or uterine rupture), tissue (retained placenta or clots), and thrombin (coagulation deficit)”. Almost 70% of cases, PPH are occurred by uterine atony, it is the most prevalent cause. PPH is connected to a wide range of risk factors, like a grand multiparty, nulliparity, and advanced maternal age. [18,19]

Table 1: Common risk factors for postpartum hemorrhage

TONE	TRAUMA	TISSUE	COAGULOPATHY
1. Uterus atony 2. Over distension (e.g., multiple pregnancy, macrosomia, polyhydramnios) 3. long or rapid labor 4. infections in uterus (chorioamnionitis) 5. Uterine fatigue from	6. Vaginal or cervical tears 7. Uterine rupture 8. Episiotomy 9. Instrumental delivery (forceps or vacuum) 10. Cesarean section 11. Fundal pressure during delivery	12. Retained placental fragments 13. Placenta previa 14. Placenta accreta 15. Incomplete removal of membranes 16. Uterine inversion	17. Pre-existing clotting disorders (e.g., von Willebrand disease) 18. Disseminated intravascular coagulation (DIC) 19. Severe preeclampsia 20 HELLP

Tone: Postpartum bleeding is controlled by the contraction and retraction of fibres of the myometrial. This causes the blood arteries to kink, which blocks blood flow to the placental region. The primary cause of PPH, uterine atony, is the breakdown of this mechanism due to disordered myometrial activity. Myometrial fibres' inability to contract and retract results in blood vessel kinking and a disruption of blood flow to the placental location. About 1 in 20

deliveries are complicated by it, and 20% of those cases don't have any obvious risk factors.

Both infection and residual placental tissue can result in uterine atony. The atony of uterus is the main cause of postpartum haemorrhage. [20]

Trauma: Even if the delivery is handled carefully, damage to the birth canal—which comprises the uterus, the cervix vagina, and perineum—may still occur. Because of the greater blood flow in all of the organs needed for delivery, the majority of the bleeding happens during pregnancy.

Tissue: Keeping all or part of the placenta in the uterus causes PPH, prevents contraction and retraction, and keeps the blood sinuses open. The bleeding is caused by the placenta's detachment from the uterine wall. Because the remaining placenta does not retract enough, the bleeding continues until the remaining organ has detached and been removed.[21, 22]

Thrombin: When the clotting mechanism fails, as it does in coagulopathies, bleeding issues result. PPH can occasionally result from any of the hemorrhagic blood dyscrasias that pregnant women may experience.

PATHOPHYSIOLOGY.

Pregnancy-related physiological changes, such as Postpartum alterations include an increase in uterine blood flow from approximately 100 mL/min in a non pregnant uterus to 700 mL/min (such as myometrial contraction and local decidual hemostatic factors), and coagulation changes that lead to a hyper coagulable state all contribute to significant bleeding. Consequently, PPH may arise from circumstances that cause these processes to malfunction. Clinical

signs and symptoms of hypovolemia usually appear when the approximate total blood volume is reduced by more than 1500 mL. [23]

MANAGEMENT OF POSTPARTUM HEMORRHAGE (PPH):

To reduce maternal morbidity and death, postpartum haemorrhage (PPH) care calls for a quick, methodical approach. It's crucial to identify PPH early and start the right treatments as soon as possible.

The administering oxytocin or a comparable uterotonic drug within a minute of the baby's birth.

Regulated traction of the cord. When used as a third-stage package, ergometrine may shorten the third stage, prevent retained placenta, and reduce mild PPHs.

Massage of the uterus after placenta birth.

MECHANISM OF HAEMOSTASIS BY UTEROTONICS: The pharmacological stimulation of uterine contractions and the encouragement of coagulation processes to prevent excessive bleeding after childbirth are the mechanisms of haemostasis in the third stage of labour that are made possible by uterotonics. In order to help expel the placenta and lower the risk of postpartum haemorrhage (PPH), uterotonics are drugs that are particularly made to increase uterine tone and contraction strength.[24,25]

• Contractions of the Augmented Uterus: The main way that uterotonics, like oxytocin and its synthetic analogues (like carbetocin), work is by attaching themselves to receptors of the oxytocin on the uterus smooth muscles. The uterine muscle becomes more contractile as a result of this binding's stimulation of intracellular signalling pathways. Uterotonics reduce blood loss by increasing uterine contractions, which speed up the placenta's ejection.

• Compression of Blood Vessels: The uterine wall's blood vessels are compresse d as a result of the uterotonics' increased uterine contractions. By reducing blood flow to the placental bed and obstructing maternal blood arte ries, this compression serves to minimise bleeding and promote haemostasis.

• Coagulation Promotion: Certain uterotonics may indirectly affect the coagulati on cascade in addition to increasing uterine contractility. For instance, it has been demonstrated that oxytocin stimulates decidual cells to secrete tissue factor, starting the coagulation cascade's extrinsic pathway. This further aids in haemostasis and lowers the risk of PPH by causing fibrin cl ots to develop at the placental location.

Preventing Uterine Atony: One of the main risk factors for PPH is uterine atony, which is characterised by weak contractions and insufficient uterine tone. By encouraging prolonged uterine contractions, uterotonics help prevent uterine atony and promote efficient haemostasis throughout the third stage of labour. Overall, by strengthening uterine contractions, allowing placental evacuation, encouraging coagulation, and preventing uterine atony, uterotonics serve a critical role in establishing haemostasis throughout the 3rd stage of the labour. In order to decrease the risk of the PPH and guarantee the safety of mothers during childbirth, these pharmaceutical therapies are crucial.

Uterotonics List:

1. Oxytocin
2. Carbetocin
3. Ergot Alkaloids (Ergometrine, for example)
4. Prostaglandins, such as Dinoprostone and Misoprostol
5. Carboprost
6. Sulprostone

After a vaginal or Caesarean section birth, these are balloon catheters were used to be inserted into the uterus to control PPH tamponade:[48]

The first system of uterine tamponade balloons created especially for the treatment of obstetric hemorrhage is the “Bakri tamponade balloon catheter”. The silicone balloon, which has a maximum suggested fill volume of 500 mL, is

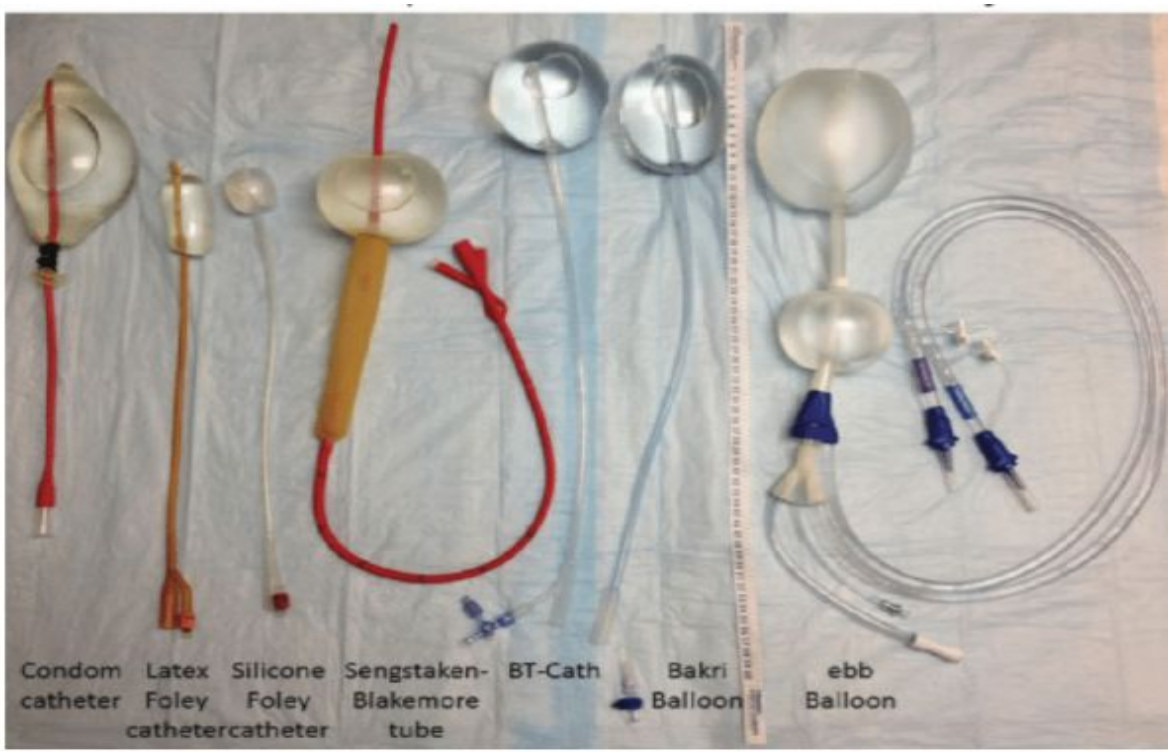
attached to a 24-cm-long French silicone catheter. After being filled with fluid, the collapsed balloon is placed within the uterus, where it adjusts to the shape of the uterus to stop bleeding. The central lumen of a catheter facilitates drainage and is intended to track continuous bleeding above the balloon's level. The gadget is meant to be used only once.

BT-Cath: This silicone balloon has a maximum suggested fill volume of 500 mL and is shaped like an inverted pear to accommodate the uterine contour. Unlike the Bakri tamponade balloon catheter, the end of the BT-Cath catheter is flush with the end of the balloon. The double lumen catheter contains two lumens: one for letting blood drain from the fundus and the other for inflating the balloon and injecting saline. It should only be used once.

The ebb tamponade system is a dual polyurethane balloon device that consists of an upper uterus balloon (a maximum suggested fill volume of 750 mL) and a lower vaginal balloon (maximum advised fill volume of 300 mL).[60]
Monitoring of any possibly continuous or recurring bleeding from above the uterine balloon is made possible by a central drain. You should only use the device once. The following are more instruments that are being used for the treatment of uterine tamponade but aren't intended for this use:

Bleeding oesophageal varices are treated with the Sengstaken-Blakemore tube.
One or more catheters made by Foley are used to drain the bladder.
Urological balloon Rusch (to expand the bladder).
A condom is placed on the end of a Foley-type catheter, filled with a maximum of 500 milliliters of fluid using the catheter, and has its base fastened to the catheter in order to prevent leaks.
a size 8 surgical glove that can store up to 500 mL of fluid and is connected to an intravenous infusion or other catheter. Latex rubber is used to make “condom

catheters, surgical gloves, and Rusch balloons; silicone or polyurethane" are used to make the other devices.[61]



Picture-1: Different types of Uterine Balloon Tamponade

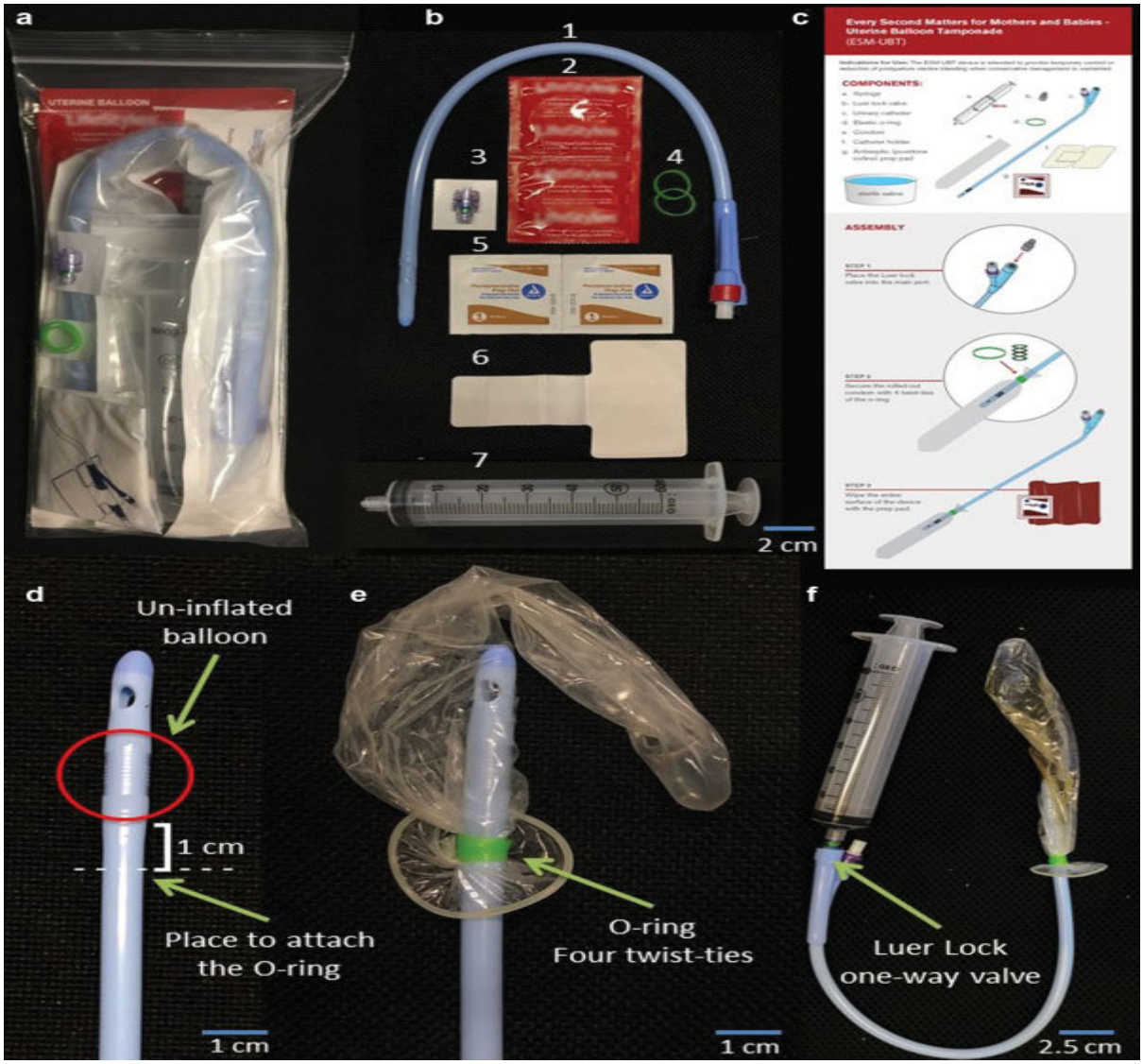
Dr. Burke's Every Second Matters-Uterine Balloon Tamponade (ESM-UBT):

In low- and middle-income countries (LMICs), where access to expensive medical equipment is frequently restricted, Dr. Burke's "Every Second Matters-Uterine Balloon Tamponade (ESM-UBT)"[60] is a novel and economical intervention designed to treat refractory postpartum haemorrhage (PPH). The ESM-UBT device uses a balloon that is implanted and inflated inside the uterine cavity to mechanically compress the uterus, providing a straightforward, non-surgical approach to managing atonic PPH.

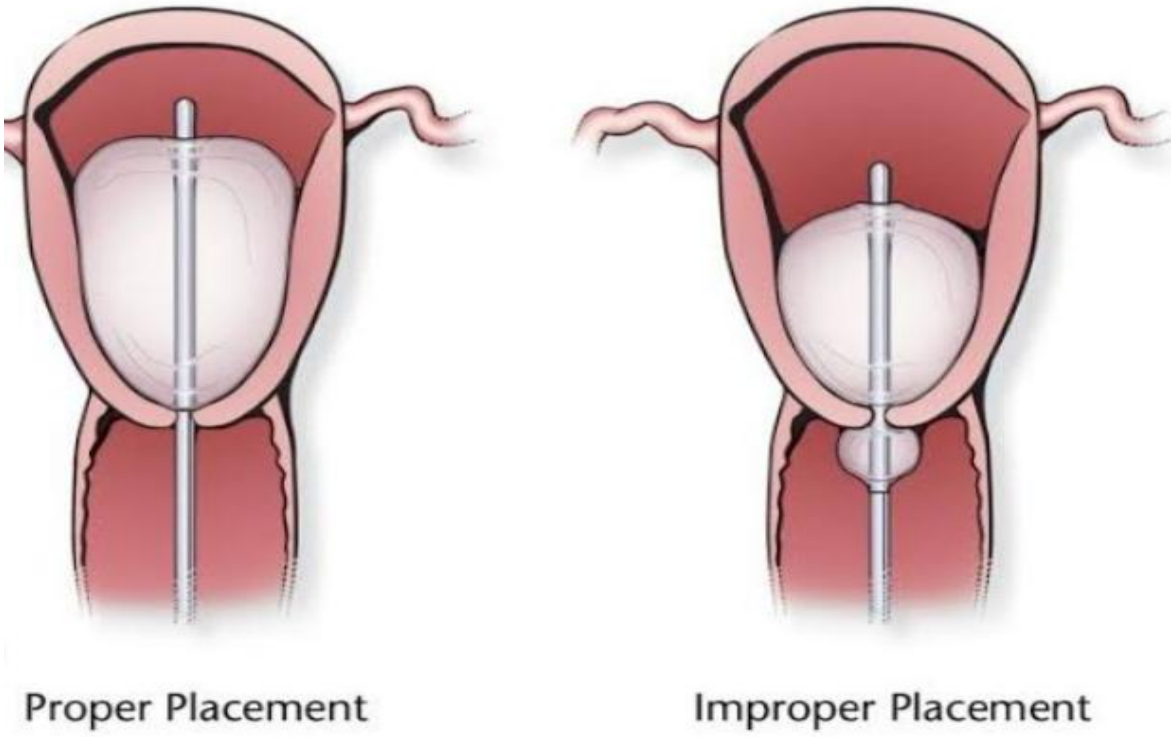
One of the main causes of maternal death, especially in environments with limited resources, is PPH brought on by uterine atony. The Global Health Innovation Laboratory at Massachusetts General Hospital produced the ESM-

UBT device to fill the gap left by the high price of uterine balloon tamponade devices that are sold commercially.[26] Because of its extremely low cost, the ESM-UBT is more accessible and applicable in places where access to cutting-edge medical facilities and surgical procedures may be limited. The gadget is simple to use, requires few resources, and may be installed by qualified medical professionals. In order to control bleeding, the ESM-UBT uses a balloon that is inflated with a sterile fluid after it has been inserted inside the uterus. Research has shown that ESM-UBT is well tolerated by patients and improves survival rates from refractory atonic PPH. It has been put into practice. It has been used in a number of LMICs and has demonstrated promise in lowering PPH-related maternal mortality.

Because the ESM-UBT device is affordable and associated with fewer invasive surgeries, such as hysterectomy, many women who might otherwise require such surgical treatments are able to keep their fertility. When resources are limited, this non-surgical approach has revolutionized the field by offering a practical, life-saving substitute.[27]



Picture 2: The assembling of the ESM-UBT kit and device: Every Second Matters for Mothers



Picture-3: Placement of Uterine Balloon Tamponade

PHARMACOLOGY OF OXYTOCIN:

The FDA has approved oxytocin for use in obstetrics for two specified time periods: antepartum and postpartum. Exogenous oxytocin is FDA-approved for enhancing uterine contractions during the antepartum phase in order to facilitate a successful vaginal birth of the foetus.

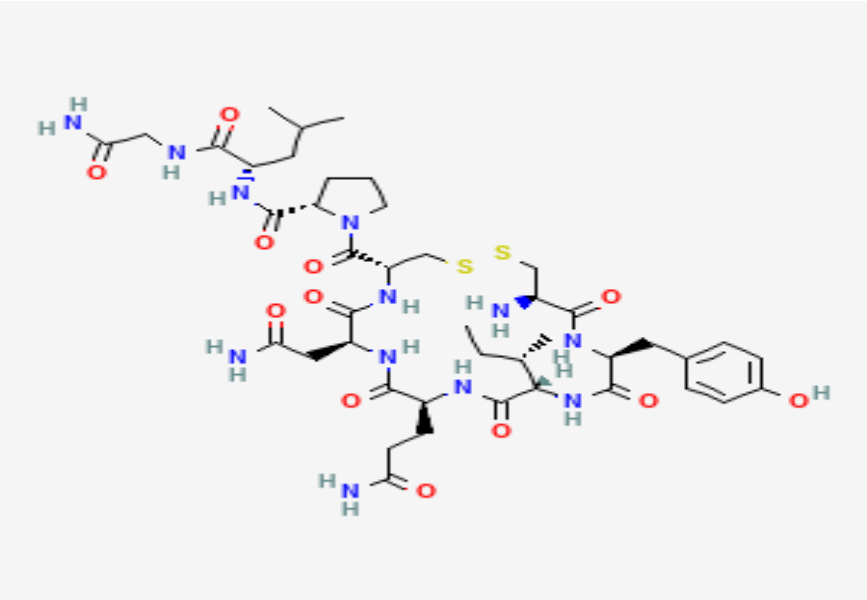
During the antepartum phase, oxytocin is recommended in three circumstances:

1. For moms with maternal diabetes, preterm membrane rupture, or preeclampsia.
2. For women who had unavoidable or partial second-trimester abortions.
3. For women whose uteri are dormant and need to be stimulated to begin labour.

The chemical structure of oxytocin is as follows

1. Amino acid sequence: Cys-Tyr-Ile-Gln-Asn-Cys-Pro-Leu-Gly
2. Molecular formula: C43H66N12O12S2
3. Molecular weight: Approximately 1007.2 g/mol

Oxytocin contains a disulfide bridge formed between the two cysteine amino acids (Cys) at positions 1 and 6, which contributes to its stability and biological activity. This structural feature is crucial for its physiological functions, including uterine contractions during childbirth and milk ejection during breastfeeding.



Picture 4: Chemical structure of Oxytocin

Mechanism of Action:

An oligopeptide hormone called oxytocin is essential to reproductive function. The hypothalamus synthesises this nonapeptide, which has nine amino acid residues. It is produced in the hypothalamus, but the posterior pituitary gland—more especially, the pars nervosa, or neural lobe—stores and subsequently releases it. The 1 of the two hormones by the posterior pituitary produces and releases is oxytocin, with antidiuretic hormone (ADH). In contrast to the negative feedback loops found in many other hormones, such as ADH, oxytocin has a positive feedback mechanism, which distinguishes it from the majority of other hormones.[28]

By attaching itself to G-protein-coupled receptors on the uterine myometrium, oxytocin promotes uterine contractions when it is released into the bloodstream. A series of intracellular processes are set off by this interaction, most notably the rise in intracellular calcium levels in the uterine myofibrils, which improves uterine contractility. The evolution of labour revolves upon this process. Mechanical stimuli, such the head of the foetus pressing against the cervix, cause the posterior pituitary to release oxytocin. As the cervix stretches, nerve impulses are sent to the brain, where they cause the production of oxytocin, which in turn causes further contractions of the uterus. As oxytocin secretion is further increased, these contractions become more frequent and intense, and they continue until delivery.[29] This positive feedback loop guarantees the fetus's successful ejection. Oxytocin has a vital function in lactation in addition to its effects on the uterus. The myoepithelial cells that encircle the female breast's alveolar ducts contract in response to oxytocin stimulation during breastfeeding. This contraction facilitates milk ejection by forcing milk from the ducts into bigger sinuses. The positive feedback loop that governs milk ejection is similar to that of uterine contractions during labour. Oxytocin is released as the baby tries to latch onto the breast, and it circulates through the bloodstream to encourage more milk production and release.[30]

Pharmacokinetics:

Oxytocin can be administered via intravenous, intramuscular, or intranasal routes. Intravenous administration ensures rapid onset of action within 1-2 minutes, while intramuscular administration leads to a slightly delayed onset, typically within 3-5 minutes. Metabolized primarily in the liver, oxytocin is excreted primarily through the kidneys via urine.[31,32]

Dosage:

Dosage varies based on the indication. For inducing labor, intravenous infusion typically starts at 0.5-2 milliunits per minute, gradually titrating until adequate

contractions are achieved. Higher initial doses may be required to manage postpartum hemorrhage effectively.

Absorption:

Intravenous administration results in rapid and complete absorption, yielding immediate effects. Intramuscular administration leads to slower absorption compared to the intravenous route.

Excretion:

After hepatic metabolism, oxytocin and its metabolites are primarily excreted through the kidneys via urine.

Half-life:

Oxytocin has a relatively short half-life, ranging from 3 to 5 minutes, necessitating continuous infusion or frequent dosing to maintain therapeutic effects.

Contraindications:

Oxytocin is contraindicated in cases where vaginal delivery is not advisable, such as placenta previa, fetal distress, or cephalopelvic disproportion. It should not be used in patients with hypersensitivity to oxytocin or its components, cardiovascular disorders.[33]

Adverse Effects:

Common adverse effects include uterine hyperstimulation, leading to fetal distress, uterine rupture, or postpartum hemorrhage. Other adverse effects may include nausea, vomiting, headache, and abdominal pain. Water intoxication is a rare but severe adverse effect, especially with prolonged use at high doses.[34]

Posever, Sipahi, Shivkumar et al., (2022) conducted a study in Madhya Pradesh on very Second Matters uterine balloon tamponade (ESM-UBT). In March 2020, semi-structured interviews were carried out to thematic saturation. Eligible provider cadres included professors, program directors, nurses, and residents in obstetrics and gynaecology. Interviews were conducted with 62 obstetric doctors. Training them regularly, increased collaboration and communication, effective program leadership, and the participation of lower-level facilities were all factors that facilitated implementation. Administrative challenges, significant employee turnover, language obstacles, and the resources needed to reach and train lower-level institutions were among the implementation roadblocks. In general, the ESM-UBT package was considered a helpful intervention by most clinicians to support attempts to lower mother mortality from postpartum haemorrhage. In 10 Indian medical facilities, the ESM-UBT package is thought to be a useful intervention for treating refractory atonic postpartum hemorrhage and reducing maternal morbidity and mortality. Future implementation efforts should be guided by the identified enablers and challenges to the ESM-UBT package's implementation in India.[35]

A study conducted by **Burke, Shivkumar and Priyadarshani** et al.,(2022) to assess the effects of implementing a uterine balloon tamponade (ESM-UBT) device in Indian healthcare institutions for the treatment of severe postpartum haemorrhage (PPH), primarily caused by uterine atony, on the rates of maternal death from PPH and the need for invasive PPH control operations. Prior to and following the implementation of ESM-UBT. In the study sample, there had been 214 123 deliveries (n = 78 509 before ESM-UBT was introduced, n = 47 211 before the start of ESM-UBT, and n = 88 403 after the introduction of ESM-UBT). Following the adoption of ESM-UBT, the main composite outcome rate at intervention institutions dropped dramatically (21.0–11.4 per ten thousand

births; differential -9.6, 95% confidence interval (CI) -14.0 to -5.4). The main composite outcome rate at control facilities did not change significantly (11.7–17.2 per ten thousand births; differential 5.4, 95% CI). With an adjusted DID estimate of -15.0 per ten thousand points, a 95% confidence interval (CI) of -23.3 to -6.8; P = 0.005, the rate of the key composite outcome was considerably lower in intervention institutions than in control facilities. Maternal deaths from PPH and/or invasive PPH control methods were significantly reduced when the ESM-UBT was used in Indian healthcare facilities.[36]

Nippal, Talawar et al., (2022) conducted a study on to assess the effectiveness of 24-French Foley catheter tamponade, which is readily available, affordable, and also measures blood loss, in treating atonic PPH following the failure of medicinal therapy. The study is prospective in nature. The subjects were haemodynamically stable PPH patients who did not improve with medicinal treatment. A 24-French Foley catheter was inserted into the uterus. Vital signs were tracked. There was vaginal bleeding monitoring. A 24-hour period was spent with the Foley catheter. 961 patients had atonic PPH. 800 individuals received intrauterine balloon tamponade using a 24-French Foley catheter. The study was done at the "Gadag Institute of Medical Sciences in Gadag, Karnataka", from June 2014 to May 2020. It worked for 766 people, or 95.75 percent of the participants. Approximately 34 individuals required surgical intervention. As a result, many surgical procedures and associated morbidity were reduced by this alternate, straightforward intervention technique. For atonic PPH, the most efficient, straightforward, and cost-effective method of limiting blood loss is intrauterine balloon tamponade using a 24-French Foley catheter.[37]

Lothe, Bhalerao et al, (2022) conducted a study to ascertain the efficacy of ESM-Uterine Balloon Tamponade (UBT) in PPH cases that do not improve with medication treatment. 26 PPH cases that were unresponsive to the medical line of treatment in which UBT was administered were examined in this prospective case-control study. Over the course of a year, data was gathered and examined. There were 1,359 deliveries overall, including vaginal and caesarean sections. Of these, 26 individuals had PPH that did not improve with medical treatment, which contributed to the 1.9% incidence of refractory PPH in this study. When ESM-UBT was used alone, the success rate was 85%; when stepwise devascularization and compression sutures were added, the percentage rose to 96.15%. The failure rate was 3.85% because one patient needed a peripartum hysterectomy despite all other precautions. In this study, no maternal deaths were noted. An inventive method for treating PPH that does not respond to medical treatment is ESM-UBT. According to our research, ESM-UBT should be used before surgery in PPH instances where medicinal therapy has failed.[38]

Liu, Goa, Liu J et al., (2021) conducted a study We determined the characteristics suggesting intrauterine balloon tamponade (IUBT) failure for postpartum hemorrhage (PPH) after delivery by conducting a retrospective cohort study of women who underwent IUBT for severe PPH following delivery during October 1, 2016, and September 30, 2017. IUBT failure was defined as necessitating further surgical procedures or uterine embolization. There were 99,650 deliveries during the study period. 106 patients with severe PPH were treated with IUBT, and the overall cure rate was 70.8% (75/106). The maximum absolute shrinking and choice operator (LASSO) regression was utilized to select the potential risk factors that might forecast IUBT failure.Early identification of the causes influencing IUBT failure is important, as is anticipation of alternative management approaches. [39]

A study on atonic PPH was carried out by **Rupali A and Gadappa** et al., (2021) The study's goal was to determine whether condom tamponade might effectively stop bleeding in atonic postpartum haemorrhage (PPH) cases that weren't responding to uterotonics. prospective observational study conducted for two years in the Govt. Medical College & Hospital's Obstetrics and Gynaecology Department in Aurangabad. Women who had atonic PPH after giving birth and were not sensitive to uterotonics were treated with UBT (uterine balloon tamponade). The success rate was recorded as 96.8%. In two of the three cases, surgical intervention was conducted after the continuous bleeding for 30 minutes; among the 3rd patient, the bleeding discontinued 30 minutes following the tamponade was applied .14.2% had their UBT ejected within 6 hours, however 2 of them required an additional surgery. It offers an immediate tamponade effect during the failure and makes time to ready for another procedures.[40]

Ramanathan, Eckardt, Nelson et al.,(2018) conducted a study in kenya to examine the safety of an extremely affordable uterine balloon tamponade package (called ESM-UBT) for facility-based treatment of uncontrolled postpartum haemorrhage (PPH) in “Kenya and Sierra Leone” was the aim of this study. Between the month of September 2012 and December 2015, data on complications and adverse events for all women whom had an ESM-UBT device fitted was collected from 92 centers in Sierra Leone and Kenya as part of a multi-country study. Of the 201 women treated with an ESM-UBT device in both Kenya and Sierra Leone, 189 (94.0%) survived. Out of 189, 156 (82.5%) had a follow-up of six weeks or longer. A connection among the use of an ESM-UBT equipment and one death, three cases of perineal injury, and one instance of moderate endometritis could not be completely ruled out. A possible link between these injuries and an ESM-UBT device was deemed extremely

implausible by three specialists. Women with uncontrolled PPH seem to be able to safely utilise the ESM-UBT device.[41]

A study done by **Anshu Mishra** (2018) was to evaluate the connection between uterine artery blood flow patterns and balloon distension. 16 females participated in this investigation. Both a vaginal and uterine balloon were part of the Obstetric & Temporanade System (OTS). Before the balloon was inflated, blood pressure was measured. The patients were born vaginally (12) and by caesarean (4), weighed 145± 12 pounds, were 62± 2.7 inches tall, and had a gravidity/parity ratio of 2 [1–6]/1. Their gestational age was 37.6± 1.4 weeks. The mean "systolic blood pressure" was 106.42 mm Hg, the maximum pressure was 58.22 mm Hg, the maximum infusion volume was 960 mL, and the estimated blood loss was 440 ml. The intraluminal pressure increases curvilinearly as the volume of an intrauterine tamponade balloon is increased. At maximal expanded volume, the intraluminal pressure was lower than the systolic blood pressure in all patients with reversed diastolic flow. [42]

Durmont, Bodin, Hounkpatin et al., (2017) conducted a Randomized control trail to identify the effectiveness of inexpensive uterine tamponade in treating uncontrolled postpartum haemorrhage (PPH) in low-resource environments as a supplement to misoprostol. In addition to receiving intrarectal or sublingual misoprostol, women were randomised to receive either no tamponade or uterine balloon tamponade with a condom-catheter device. The proportion of the initial composite outcome did not differ significantly between the tamponade arm (16%; 9/57) and the standard second line treatment arm (7%; 4/59): risk ratio 2.33 (95% CI 0.76 to 7.14, p=0.238). A significantly larger proportion of women with tamponade + misoprostol reported total blood loss above 1000 mL than those using misoprostol alone: risk ratio 1.52 (95% confidence interval

[CI] 1.15 to 2.00, p=0.01). The case fatality rate was higher in the tamponade group (10%; 6/57) than in the control group (2%; 1/59) (p=0.059).[43]

Kinugasa, Tamai, Miyake et al.,(2015) Case report shows that uterine balloon tamponade is a useful technique for managing postpartum hemorrhage, success rates have been shown to range from 60% to 80%. The patient experienced severe bleeding as a result of uterine atony following an induced delivery. Bimanual uterine compression and oxytocin infusion did not stop the estimated 2,800 mL or more of blood loss. The second instance was later characterized as severe disseminated intravascular coagulation and placental abruption exacerbated by fetal mortality. The transfusions of blood, fluids, and uterotonics were given, but the bleeding continued. In average more than 5,000 milliliters of blood were lost. In another case, a tranexamic acid-impregnated gauze wrap was given to wrap the catheter of intrauterine balloon, which was after placed inside the uterus and inflated with sterilized water.[44]

Martin, Legedre, Bouet et al., (2015) to see the effectiveness of "uterine balloon tamponade" in managing postpartum bleeding in mothers. 49 women underwent uterine tamponade: 19 (39%) after cesarean section and 30 (61%) after vaginal delivery. Eighty-six percent of the hemorrhages were caused by uterine atony. The success percentage was 65% overall. Out of the 17 failures, 16 required surgery, including one uterine artery embolization and 11 hysterectomy instances. The success and failure groups did not differ substantially in terms of demographics or obstetrics. The balloon tamponade was not directly responsible for any postpartum problems. In the study the Postpartum hemorrhage was not seen in two women who had full-term pregnancy.[45]

Kavak SA, Kavak EC, Demirel et al., (2014) conducted a study to show the effectiveness of a double-balloon cervical ripening catheter in treating

postpartum haemorrhage. Seven patients had double-balloon catheters, and each one was positioned correctly. To stop the bleeding, no additional measures were required. Five patients underwent caesarean sections, while two patients were born vaginally. Patients who had vaginal deliveries stayed in the hospital for longer periods of time—on average, 12 days, compared to 5 days for patients who had caesarean sections. Patients who had vaginal deliveries were also needed more blood and blood component transfusions. The intractable bleeding from the lower portion of the uterus and the upper vaginal regions was successfully reduced by the "double-balloon cervical ripening catheter". [46] By using this approach, patients can avoid more invasive surgeries.[46]

A study conducted by **Tirumuru, Saba, Morsi** et al., (2013) to assess balloon tamponade's performance in treating postpartum haemorrhage (PPH). In which review of 58 women who had balloon tamponade for severe PPH at Russell's Hall Hospital, a busy district general hospital in the United Kingdom, over a 5-year, 10-month period. Control of bleeding without the need for additional intervention was considered clinical success. Twenty-seven (46.5%) and thirty-one (53.5%) of the fifty-eight women (mean age: 30 years; range: 18–42 years) who underwent balloon tamponade delivered delivery vaginally and via caesarean section, respectively. Uterine atony was the main cause of PPH (31 cases). Eleven high-risk women received balloon tamponade as a preventative measure against possible PPH. Ten cases used Bakri balloons, and forty-eight cases used Rusch balloons. The balloon tamponade clinical success rate was 87.2%. In this study, three patients needed hysterectomy. With success rates of about 87%, balloon tamponade is a useful treatment for severe PPH. Given its simplicity, low rate of complications, and capacity to preserve reproductive function, there ought to be a last bar for the preventative usage of this tamponade among women who are at greater risk of PPH.[47]

Rathore, Gupta and Manaktala et al.,(2012) done a study to investigate the effectiveness and side effects of uterine tamponade in non-traumatic postpartum haemorrhage (PPH) utilising a condom catheter balloon.This prospective study was carried out in an Indian teaching hospital that provides tertiary care. The study comprised 18 patients with non-traumatic PPH who were not improving with medical treatment. A saline-filled condom catheter balloon was used to achieve uterine tamponade, and it was left in place for 8–48 hours. The condom catheter balloon was filled with 409 mL of fluid on average. It took an average of 6.2 minutes to stop the bleeding. The condom catheter balloon was remained in place for an average of 27.5 hours. 1330 millilitres of blood were lost on average. Infectious morbidity was present in five patients (28 percent).In 94% of cases, condom catheter balloons are successful in managing non-traumatic PPH. It is an inexpensive, accessible, easy-to-use, and efficient method of treating non-traumatic postpartum haemorrhage, particularly in environments with low resources.[48]

Ishii, Sawasa, Koyama et al., (2012) conducted a study on ballon tamponade among women's who underwent c-section to control post-partum hemmorrhage. Data on all patients who had caesarian sections for placenta previa were collected from our department's clinical records.37 patients had caesarian sections during the period under analysis because of placenta previa, or low-lying placenta. 33 (89%) received conservative treatment, while four (11%) had a hysterectomy as a result of placenta accreta. Ten (28%) of the 33 patients who had their uterus preserved needed an SB-tube during the caesarean section due to ongoing postpartum haemorrhage in spite of receiving the proper medical care. Among the patients who employed SB-tube, the median bleeding during the procedure was 2030±860 mL. None of them needed more extensive surgery or had serious side effects from these operations. In a patient with placenta

previa, significant bleeding from a lower uterine segment could be effectively controlled with intrauterine balloon-tamponade.[49]

MATERIALS AND METHODS

SOURCE OF DATA:

Institutional review board approval was sought [BLDE(DU)/IEC/911/2022-23]. The study was registered with the Clinical Trials of India (CTRI/ 2023/09/057173).

Consents were obtained in accordance with the declaration of Helsinki after the patient is admitted.

Patients admitted for delivery in the Department of OBSTETRICS AND GYNAECOLOGY in B.L.D.E. (DEEMED TO BE UNIVERSITY) Shri B.M. Patil's Medical College, Hospital and Research Centre, Vijayapura.

All the patients who fulfilled inclusion criteria were studied.

PERIOD OF STUDY: September 2023 to April 2025

STUDY DESIGN: RANDOMISED PARALLEL GROUP TRAIL

INCLUSION CRITERIA

Delivering viable babies with high-risk pregnancies who are prone to atonic PPH like

1. Grand multipara
2. Hydramnios

3. Pregnancy-induced hypertension patients
4. Eclampsia
5. Gestational Diabetes Mellitus
6. Cephalopelvic disproportion
7. Prolonged labour
8. Abruption
9. Deranged coagulation profile
10. Anemia
11. Twin pregnancy
12. Patient consenting for study.

EXCLUSION CRITERIA

1. Traumatic PPH
2. Adherent or retained placenta
3. Uterine rupture
4. Anomalous uterus
5. Suspected chorioamnionitis
6. Purulent infections in cervix, vagina or uterus.
7. Patient with known to have advanced cervical cancer
8. Not willing to give consent

SAMPLE SIZE- 226

SAMPLE SIZE CALCULATION

With an Anticipated Proportion of total blood loss of more than 1000mLin the UBT Group 79.6 %and among controls 52.5%[43], the study would require a sample size of a minimum of 113 per group. (i.e., a total sample size of 226 assuming equal group sizes), to achieve a power of 99% for detecting a difference in proportions between two groups at a two-sided p-value of 0.05.

Formula used

1. $$n = \frac{(z_\alpha + z_\beta)^2\ 2\ p*q}{MD^2}$$

Where Z= Z statistic at a level of significance

MD= Anticipated difference between two proportions

p=Common Proportion

q= 100-p

STATISTICAL ANALYSIS

- The data obtained is entered in a Microsoft Excel sheet, and statistical analyses are Performed using a statistical package for the social sciences (SPSS) (Version 20). Results were presented as Mean±SD, or Median±IQR, counts and percentages, and diagrams. For normally distributed continuous variables between the two groups was compared using an independent sample t-test. For not normally distributed variables, the Mann-Whitney U test is used. For Categorical variables

between the two groups are compared using the Chi-square test/Fisher exact test. . $P<0.05$ was considered statistically significant. All statistical tests will perform two-tailed.

METHODOLOGY: The following study included pregnant women with a diagnosis of high-risk pregnancy with predisposing factors to atonic PPH who were visiting the Department of Obstetrics and Gynaecology , Shri B.M. Patil Medical College Hospital and Research Centre, Vijayapura, who fulfilled the inclusion criteria and in whom the exclusion criteria has been ruled out. Written and informed consent has been obtained from all participants. Detailed History and clinical findings were recorded in the prescribed proforma. Preoperative pulse, Blood pressure and complete blood count shall be done.

Patients have been selected for the study based on inclusion and exclusion criteria and randomised into two groups.

Group 1-The prophylactic BURKE'S ESM-UBT was applied with 10 units of Oxytocin IM injection for high-risk women prone to atonic PPH.

The CONTENTS OF BURKE'S ESM-UBT includes.

1. ESM-UBT catheter
2. Large 60ml syringe
3. Two O rings
4. Two condoms

5. Two Iodine wipes

6. Catheter holder

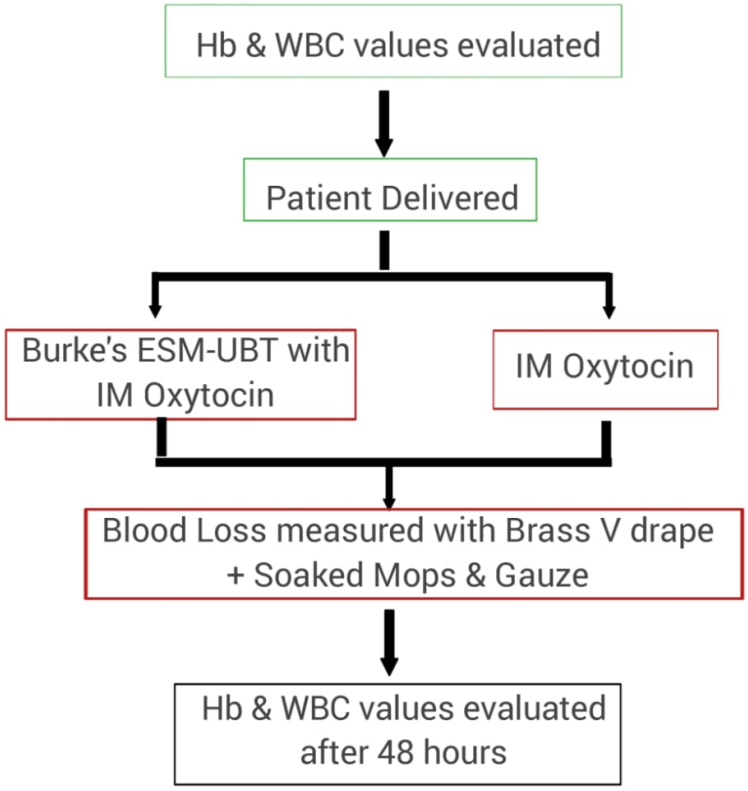
- Burke's ESM-UBT catheter was inserted halfway into a condom balloon; then silicon O ring is wrapped four times around the base of the balloon to prevent leakage of saline. It was then disinfected by using iodine wipes. Then UBT was inserted into the uterus through the cervical opening. Next, 15ml of Normal saline (NS) drawn into the syringe and pushed in ESM-UBT catheter opening, which inflates a smaller ESM-UBT catheter balloon. Next 50ml NS is drawn and pushed into a one-way valve in the catheter which inflates the main condom balloon. This was repeated till the bleeding decreased. As the condom balloon inflates and keeps pressure on the inside of the uterus from where the bleeding was coming from, this pressure stops the bleeding. The maximum recommended inflation of condom balloon is 500ml. Drape was applied just before delivery and up to one hour after delivery. Blood is collected in BRASS V DRAPE and recorded.

Group 2-10 units of Oxytocin IM injection was given to high-risk women prone to atonic PPH without application of BURKE'S ESM-UBT.

Simple randomisation was employed to assign patients to the intervention group A or control group B in this randomised parallel group experiment. The patients were not informed of their group assignment because the

study was single-blinded. Results like blood loss, transfusion need, and extra uterotonics were evaluated.

Figure 1: Flowchart showing Methodology



This study is to measure the amount of blood loss.

- The amount of blood loss in atonic PPH with and without prophylactic application of uterine balloon tamponade in high-risk women was measured.
- HB values and WBC values evaluated before and after prophylactic insertion of uterine balloon tamponade after 48hrs

- Any other additional medical/ surgical intervention or information is noted.

METHODS OF MEASUREMENT OF BLOOD LOSS

GROUP 1.The blood collected in the conical calibrated drape- BRASS V DRAPE was measured and recorded. Additional soaked gauze mops and clots were weighed and noted. Gauze mops were weighed before and after use, and the net amount of blood loss was recorded approximately 1 gram, representing 1 milliliter of blood.[48]

GROUP 2. The blood collected in conical calibrated drape BRASS V DRAPE was measured and recorded. Additional soaked pads and clots are weighed and noted.

RESULTS

A total of 5221 pregnant women had normal delivery in the center. 282 were assessed 234 participants fits to the inclusion criteria and 226 consenting women were enrolled in this study and were randomly assigned into two groups that is group A and group B by computer generated randomized program.

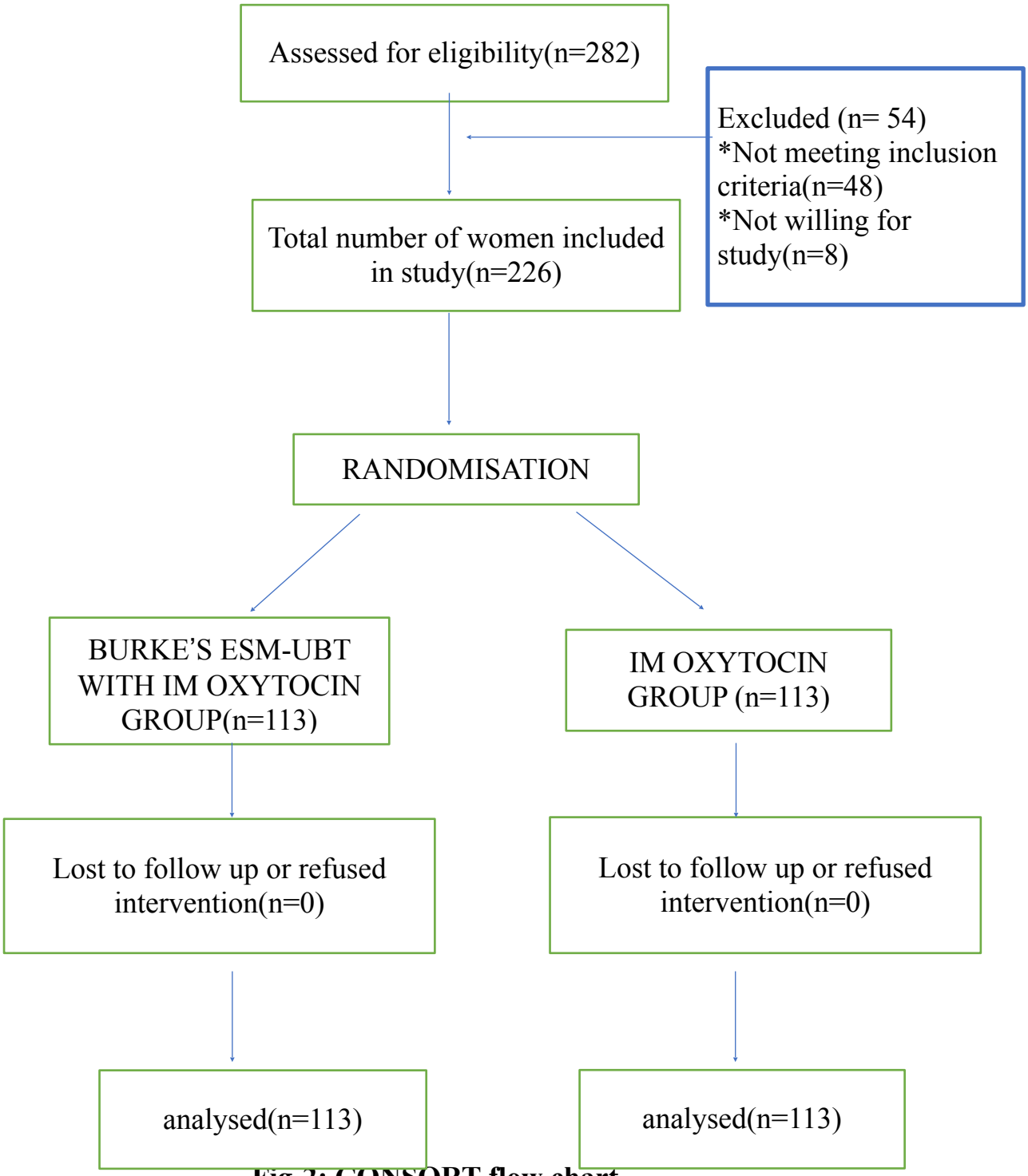


Fig-2: CONSORT flow chart

Results

Table 1 : Age groups distribution among study Participants (N=226)

Age in years	Frequency	Percentage
18-20	30	13
21-25	104	46
26-30	55	24
36-40	37	17
Total	**226**	**100**

Table 1: Among the 226 patients enrolled, majority of the study population (46%) belonged to the age group of 21-25 years. 55 patients (24%) belonged to 26-30 years, while 17% were in the age group of 18-20 years, and 13% in the age group of 36-40 years. The mean age of our study population was 29.5±4.9 years.

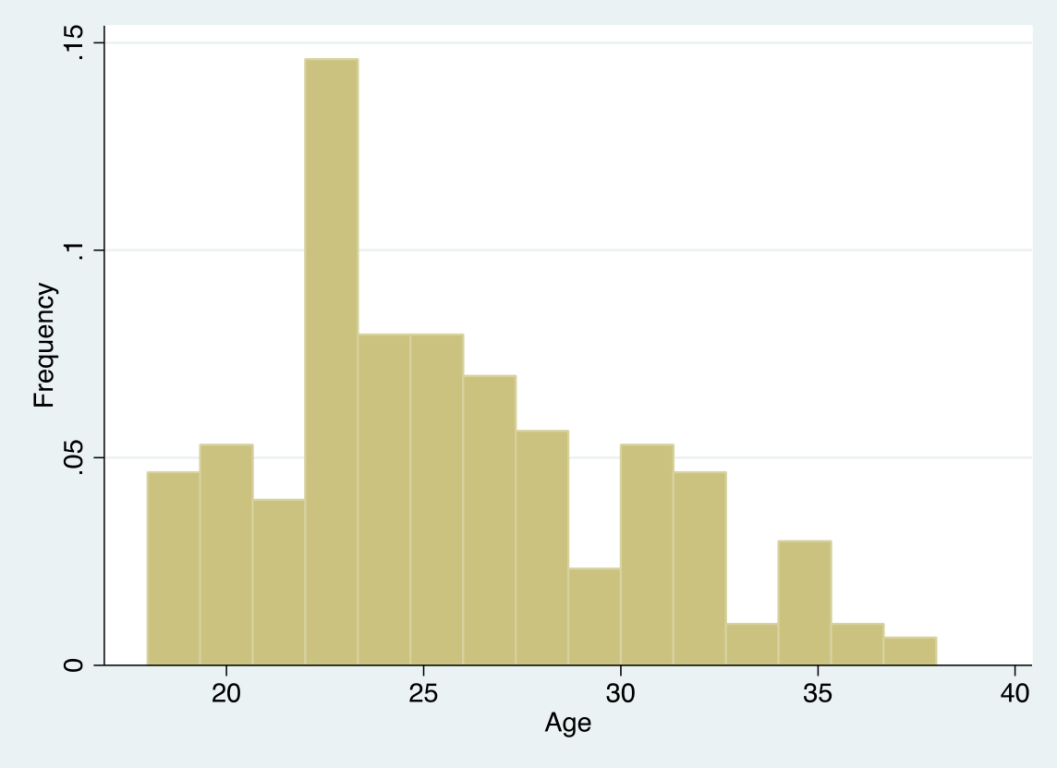


Figure 3: Distribution of study Participants based on age

Table 2: Distribution of period of gestation among study Participants (N=226)

Period of gestation (in weeks)	Frequency	Percentage
<37w	45	20
37w+1d-38w	45	20
38w+1d-40w	103	45
40w+1d-42w	33	15
Total	**226**	**100**

The study participants' gestational age distribution is shown in Table 2. The most prevalent gestational age at delivery was between 38 weeks + 1 day and 40 weeks, with the largest percentage of participants (45%) having this gestational age. Twenty percent of the study group were participants with a gestational age of less than 37 weeks and those between 37 weeks + 1 day and 38 weeks. Furthermore, 15% of individuals gave birth between 42 weeks and 40 weeks + 1 day.

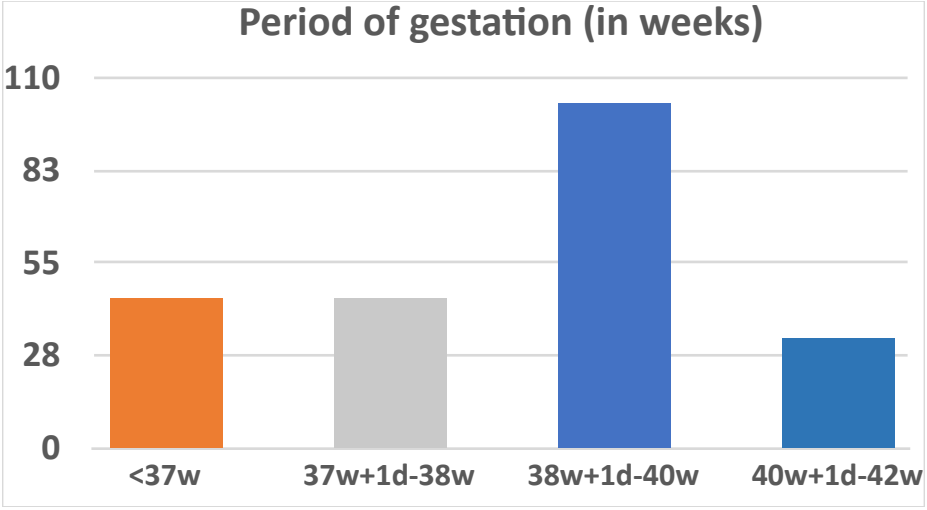


Figure 4: Period of Gestational among study Participants

Table 3: Complications among study groups (N=226)

Characteristics	**Intervention Group**	**Control Group**
	n(%)	n(%)
Pregnancy Induced Hypertension (PIH)	28 (24.7)	28 (24.7)
Abruption	5 (4.5)	7 (6.2)
Antepartum Eclampsia	8 (7.0)	6 (5.3)
Polyhydramnios	1 (0.8)	1 (0.8)
Twin Pregnancy	4 (3.5)	7 (6.2)

Gestational DM	4 (3.5)	7 (6.2)
Anaemia		
Mild	2 (1.7)	2 (1.7)
Moderate	38 (33.6)	41 (36.3)
Severe	4 (3.6)	6 (5.4)
Thrombocytopenia	7 (6.2)	5 (4.3)

The table 3 shows the comparison of pregnancy-related risk factors among study groups. Among the intervention 24.7% of participants had pregnancy-induced hypertension (PIH), 4.5% had abruption, 0.8% had polyhydramnios, 3.5% had diabetes mellitus (GDM), 3.5% had twin pregnancies, 7.0% Antepartum Eclampsia, Moderate anemia was seen in 33.6%, mild anemia was 1.7%, severe anemia is 3.6% and thrombocytopenia was 6.2%.

In control group 24.7% of participants had pregnancy-induced hypertension (PIH), 6.2% had abruption, 0.8% had polyhydramnios, 6.2% had diabetes mellitus (GDM), 6.2% had twin pregnancies, 5.3% had Antepartum Eclampsia, Moderate anemia in 36.3%, mild anemia was 1.7%, severe anemia is 5.4% and thrombocytopenia was 4.3%. Both group have similar high risk factors with a p value >0.05.

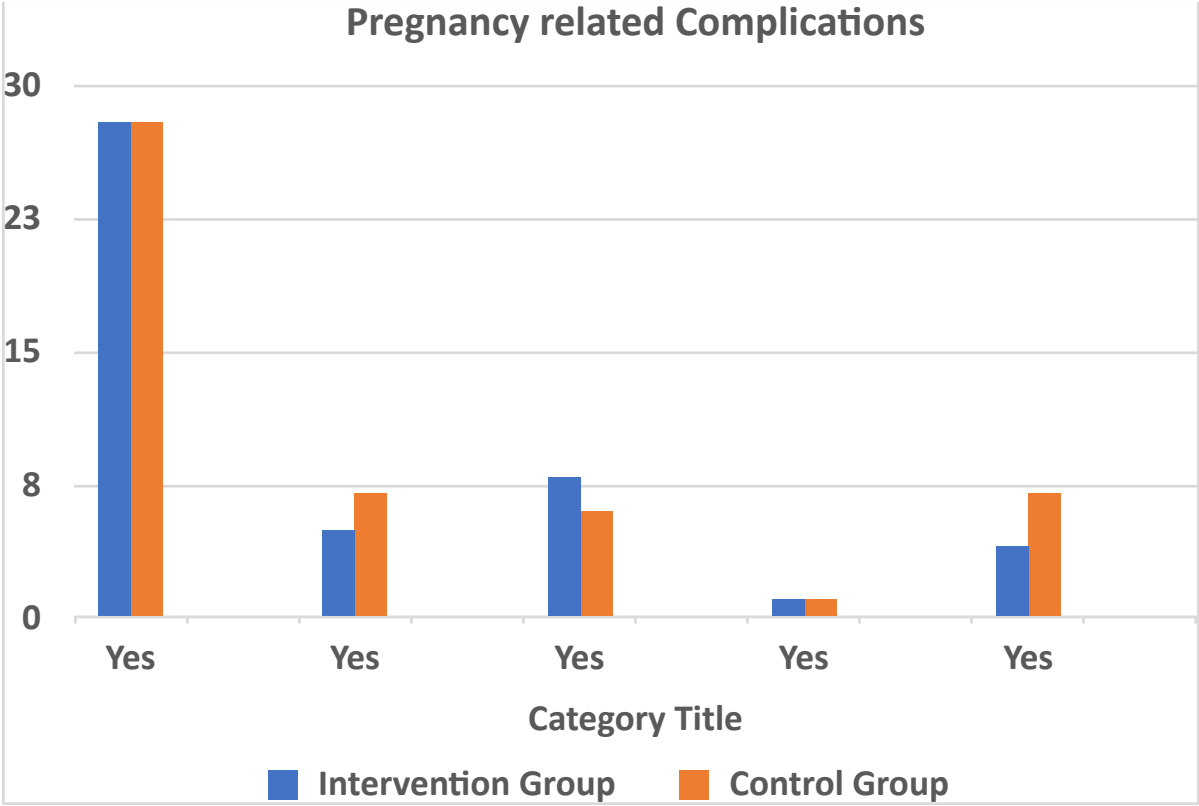


Figure 5: Complications among study groups (N=226)

Table 4: Comparison of Blood in V Drape among study groups (N=226)

Blood V Drape (ml)	Intervention Group (Burke's ESM-UBT)				Control Group				P value
	Median	IQR	95% CI		Median	IQR	95% CI		0.0001
			Lower bound	Upper bound			Lower bound	Upper bound	
	90	60-210	80	120	250	130-360	210	300	

Table 4 shows the Blood loss in the V-Drape among study groups. Median blood loss among intervention group was found to be 90 ml, with an interquartile range (IQR) ranging from 60 to 210 ml. The 95% CI was found to be between 80 and 120 ml. On the other hand, Median blood loss among control group was found to 250 ml, with an IQR of 130–360 ml and the 95% CI of the control group was found to be 210–300 ml. The Statistically significant was seen between the group with a p value <0.01

Table 5: Comparison of weight of Gauze pads among study groups (N=226)

weight of Gauze pads (grams)	**Intervention Group (Burke's ESM-UBT)**				**Control Group**				**P value**
	Median	**IQR**	**95% CI**		**Median**	**IQR**	**95% CI**		**<0.01**
			Lower bound	**Upper bound**			**Lower bound**	**Upper bound**	
	30	20-50	30	50	50	30-90	50	60	

Table 5 shows the weight of guaze pads among study groups. Median weight of gauze pads among intervention group was found to be 30 grams, with an interquartile range (IQR) ranging from 20 to 50 grams. The 95% CI was found to be between 30 and 50 grams. On the other hand, Median weight of gauze pads among control group was found to 50 grams, with an IQR of 30–90 grams and the 95% CI of the control group was found to be 50–60 grams. The Statistically significant was seen between the group with a p value <0.01

Table 6: Comparison of Total Blood loss among study groups (N=226)

Total Blood Loss (ml	**Intervention Group (Burke's ESM-UBT)**				**Control Group**				**P value**
	Median	**IQR**	**95% CI**		**Median**	**IQR**	**95% CI**		**0.0001**
			Lower bound	**Upper bound**			**Lower bound**	**Upper bound**	
	120	80-260	100	180	320	190-440	261	364	

Table 6 shows the Total Blood loss among study groups. Median total blood loss among intervention group was found to be 120 ml, with an interquartile range (IQR) ranging from 80 to 260 ml. The 95% CI was found to be between 100 and 180 ml. On the other hand, Median total blood loss among control group was found to 320 ml, with an IQR of 190–440 ml and the 95% CI of the control group was found to be 261–364 ml. The Statistically significant was seen between the group with a p value <0.01

Table 7: Comparison of Blood loss among study groups (N=226)

Blood Loss	Intervention Group (Burke's ESM-UBT)				Control Group				P value
	Median	IQR	95% CI		Median	IQR	95% CI		
			Lower	Upper			Lower	Upper	
Blood Loss before	20	10-30	10	20	30	20-50	20	30	0.0005
Blood Loss 5 min after	50	30-110	35.5	74.4	150	80-200	110	178.7	0.0001
Blood Loss 10 min after	30	20-70	30	50	80	50-110	70	90	0.0001
Blood Loss 1 hour after	20	20-50	20	30	50	30-65	40	50	0.000

Table 7 shows the Blood loss at different tie intervals among study groups. Median blood loss before among intervention group was found to be 20 ml followed by blood loss after 5 minutes of delivery is 50, 10 min after delivery is 30 ml and after 1 hour delivery is 20ml. On the other hand in control group Median blood loss before delivery was found to be 30 ml followed by blood loss after 5 minutes of delivery is 150, 10 min after delivery is 80 ml and after 1 hour delivery is 50ml. All intervals were found to be statistically significant with a p value <0.01.

Comparison of Hemodynamic parameters

Table 8: Comparison of Heart rate findings between Study groups (N=226)

Heart rate (bpm)	Intervention Group (Burke's ESM-UBT)				Control Group			
	Median	IQR	95% CI		Median	IQR	95% CI	
			Lower bound	Upper bound			Lower bound	Upper bound
HR before delivery	90	86-94	90	90	92	88-96	90	96
HR 5 min after delivery	90	86-94	90	90	92	90-96	90	94
HR 10 min after delivery	92	84-94	89	94	94	90-96	91	96
HR 1 hour after delivery	90	84-94	90	90	94	90-98	90	94

Table 8 shows the Heart Rate at different tie intervals among study groups. Median Heart rate before delivery among intervention group was found to be 90bpm followed by Heart rate after 5 minutes of delivery is 90 bpm, 10 min after delivery is 92 bpm and after 1 hour delivery is 90 bpm. On the other hand in Median Heart rate before delivery among intervention group was found to be 92 bpm followed by Heart rate after 5 minutes of delivery is 92 bpm, 10 min after delivery is 94 bpm and after 1 hour delivery is 90 bpm.

Table 9: Comparison of Systolic Blood pressure findings between Study groups (N=226)

Systolic Blood Pressure	Intervention Group (Burke's ESM-UBT)				Control Group			
	Median	IQR	95% CI		Median	IQR	95% CI	
			Lower bound	Upper bound			Lower bound	Upper bound
SBP before delivery	116	110-126	115	120	120	110-130	120	126
SBP 5 min after	120	116-130	116	120	120	116-130	120	120.8
SBP 10 min after	118	112-128	116	120	120	114-130	118	124
SBP 1 hour after	120	114-126	118	120	120	112-130	120	120

Table 9 shows the Systolic Blood pressure Rate at different tie intervals among study groups. Median Systolic blood pressure before delivery among intervention group was found to be 116 mmhg followed by SBP after 5 minutes of delivery is 120 mmhg, 10 min after delivery is 118 mmhg and after 1 hour delivery is 120 mmhg. On the other hand in Median Systolic blood pressure before delivery among intervention group was found to be 120 mmhg followed by SBP after 5 minutes of delivery is 120 mmhg, 10 min after delivery is 120 mmhg and after 1 hour delivery is 120 mmhg.

Table 10: Comparison of Diastolic Blood pressure findings between Study groups (N=226)

Diastolic Blood Pressure	Intervention Group (Burke's ESM-UBT)				Control Group			
	Median	IQR	95% CI		Median	IQR	95% CI	
			Lower bound	Upper bound			Lower bound	Upper bound
DBP before delivery	86	72-90	80	88.8	84	70-90	80	86
DBP 5 min after	82	74-90	80	86	84	78-90	80	86
DBP 10 min after	84	76-90	80	84.8	84	76-90	80	86
DBP 1 hour after	82	76-90	80	84	82	78-90	80	86

Table 10 shows the Diastolic Blood pressure Rate at different tie intervals among study groups. Median Systolic blood pressure before delivery among intervention group was found to be 86 mmhg followed by DBP after 5 minutes of delivery is 82 mmhg, 10 min after delivery is 84 mmhg and after 1 hour delivery is 82 mmhg. On the other hand in Median Diastolic blood pressure before delivery among intervention group was found to be 84 mmhg followed by DBP after 5 minutes of delivery is 84 mmhg, 10 min after delivery is 84 mmhg and after 1 hour delivery is 82 mmhg.

Table 11 : Comparison of Blood component findings between Study groups (N=226)

Characteristics	Intervention Group (Burke's ESM-UBT)		Control Group		P value
	Median	IQR	Median	IQR	
Hb before delivery	10.8	9.2-12	9.9	9.3-11.6	0.09
Hb 24 hours post delivery	10.1	9-11.2	9.9	7.9-10.5	0.007
PCV before delivery	33.1	29.4-35.7	31.3	28.2-34.1	0.01
PCV 24 hours post delivery	32	28-34.7	29.8	24.9-32.7	0.008

Characteristics	Intervention Group (Burke's ESM-UBT)		Control Group		P value
	Median	IQR	Median	IQR	
Hb before delivery	10.8	9.2-12	9.9	9.3-11.6	0.09
Hb 24 hours post delivery	10.1	9-11.2	9.9	7.9-10.5	0.007
PCV before delivery	33.1	29.4-35.7	31.3	28.2-34.1	0.01
MCV before delivery	80	76.1-86.2	80.2	75.5-85.5	0.6
MCV 24 hours post delivery	81.5	76.4-86.6	81.3	76.8-86	0.9
MCH before delivery	33	31.7-34.1	33.1	31.8-34.2	0.9
MCH 24 hours post delivery	32.4	31.2-33.8	32.6	31.3-33.7	0.6
Platelets before delivery	73.1	190-275	222	180-287	0.8
Platelets 24 hours post delivery	226	190-275	224	171-270	0.7
WBC before delivery	12.4	9.9-14.7	11.6	9.6-14.8	0.3
WBC 24 hours post delivery	12.3	10.2-14.3	11.4	9.9-14.6	0.3

Hb: Hemoglobin, **PCV**: Packed Cell Volume, **MCV**: Mean Corpuscular Volume, **MCH**: Mean Corpuscular Hemoglobin, **WBC**: White Blood Cell Count.

Table 11 depicts the comparison of blood component findings between groups.. the intervention group's hemoglobin level before delivery was found to be 10.8 g/dL (IQR: 9.2–12), in control group's was 9.9 g/dL (IQR: 9.3–11.6) with a p value of 0.09. The median hemoglobin level after delivery was found to be 10.1 g/dL (IQR: 9–11.2), in control group's was found to be 9.9 g/dL (IQR: 7.9–10.5). the difference is found to be statistically significant with a p value 0.008. The rest all variables like PCV, MCV, MCH, platelets and WBC before and after delivery was found to be statistically not significant with a p value >0.05.

Table 12: Comparison of use of any additional uterotonics between Study groups(N=226)

use of any additional uterotonics	**Intervention Group (Burke's ESM-UBT)**	**Control Group**	**P value**
No	104	88	0.003
Yes	9	25	
Total	113	113	

Table 12 shows the usage of additional uterotonics among study groups. The p-value of 0.003 found to be statistically significant which shows the intervention group had a significantly a smaller number of participants who need additional uterotonics which are 9, among them all 9 patients required Misoprostol, 4

required carboprost and only 2 required tranexamic acid. In control group all 25 patients were given with misoprostol followed by 20 carboprost and 12 tranexamic acid. No surgical intervention was required in both groups.

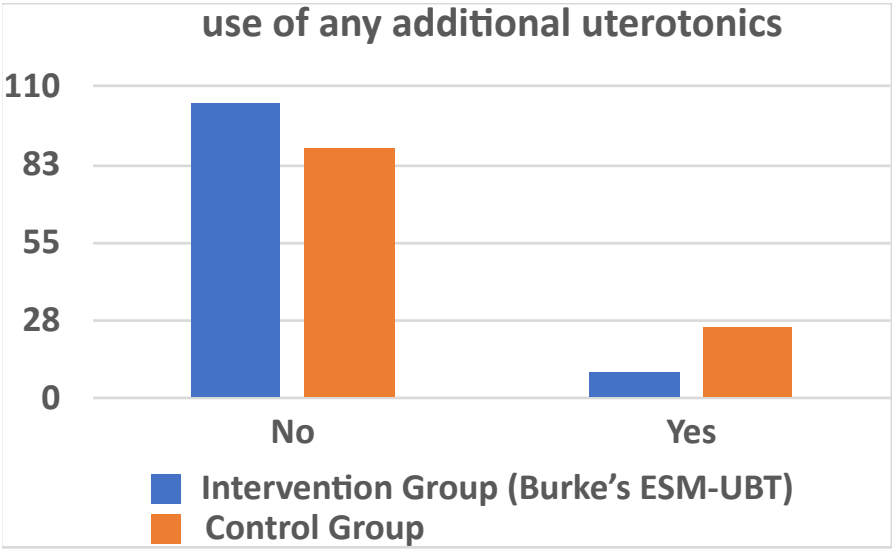


Figure 6: Comparison of use of any additional uterotonics between Study groups(N=226)

Table 13: Comparison of Blood component transfusion between Study groups(N=226)

Blood component transfusion	**Intervention Group (Burke's ESM-UBT)**	**Control Group**	**P value**
No	80	63	**0.01**
Yes	33	50	
Total	113	113	

Table 13 shows the usage of blood component transfusion among study groups. The p-value of 0.01 found to be statistically significant which shows the intervention group had a significantly less number of participants who required blood transfusion compared to the control group. In group 1, 23 anemia patients required blood component transfusion. In group 2, 31 anemia patients required blood component transfusion.

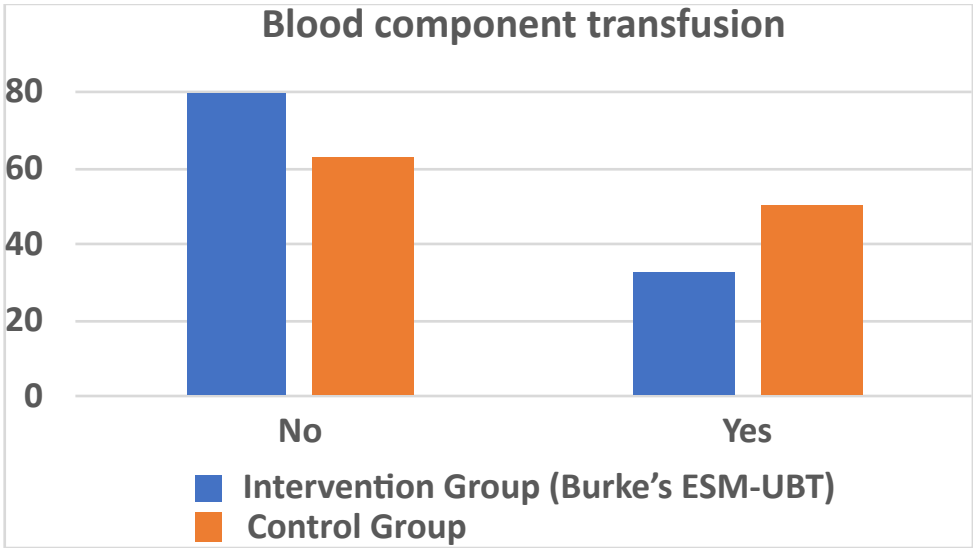


Figure 7: Comparison of Complete blood transfusion between Study groups(N=226)

An average of 287ml inflation was found in the intervention group. Thirty patients in Intervention group complained pain at insertion site after inserting UBT. The spontaneous expulsion was seen in 34 patients in intervention group.

DISCUSSION

The purpose of this study is comparison was to see the safety and efficacy of prophylactic insertion of Dr.Burke's every second matters-uterine balloon tamponade (ESM-UBT) with I.M Oxytocin vs. only I.M Oxytocin for prevention of atonic PPH in women at risk of uterine atony. A total of two hundred twenty six patients participated in the study; they were split into two groups at random and given distinct regimens.

Group A: Dr.Burke's every second matters-uterine balloon tamponade (ESM-UBT) with I.M Oxytocin And Group B: only I.M Oxytocin

- Using the appropriate statistical methods, a comprehensive analysis of the patient data was conducted. The muscles of the uterus contract quickly immediately after delivery to stop the bleeding. If the muscles of any region of the uterus, more usually the cervix or the complete uterus, not contracts early, quickly, and firmly enough, few deliveries can be complicated with fatal excessive haemorrhage.[46] A blood loss of less than 500 millilitres after the third stage of labour is considered postpartum haemorrhage. If the amount of blood lost is significant enough to harm the mother's haemodynamic system, serious maternal outcomes, including death or multiorgan failure, may ensue. An atonic uterus is the most prevalent cause of postpartum haemorrhage and the main cause of maternal death. The most majority of women who are with PPH have no known risk factors, but some conditions in obstetric are linked to an increased risk of PPH which includes multiple pregnancies, placenta

previa, adherent placenta, labour dystocia, prolonged labour, multiparity, obstructed labour, and PPH history.[50]

- Tranexamic acid, uterine massage, and uterotonics are the firstline treatments that many women with PPH respond well. Ten to twenty percent of PPH women, do not react well to these treatments. The PPH morbidity and mortality are mainly influenced by women with uterine atony. Other procedures which includes UBT, are “uterine artery embolization, devascularization gradually, compression sutures such the B-Lynch, Hayman's, and Cho sutures”, and, in the event that nothing else works, rescue hysterectomy, may be explored. Laparotomy, specific skills, and expensive operating rooms and setup are required for the second line of treatment.[38] UBT does not require an expensive setup and is an inexpensive, easy-to-use process with a short learning curve. There are numerous varieties of balloon tamponade available, and each has advantages, disadvantages, and varying degrees of effectiveness. This research examined the efficacy of ESM-UBT in the treatment of PPH.
- Although ESM-UBT has lately demonstrated remarkable efficacy in stopping bleeding and saving the lives of women with uncontrolled PPH, UBT device availability and training are limited.

Table 14:Comparison of blood loss with existing literature after therapeutic insertion of UBT

STUDY	Blood loss
Francois (2023)	256ml vs 545 ml
Dumont (2017)	>1000ml
Sharvari (2015)	850ml to 3500ml
Thappa (2010)	1.2 litre

- The study reveals a significant difference of total blood loss among study groups with a p value of <0.01 the median values of blood loss between group A 120 (80-260) and group B 320 (190-440) ml.
- Similar to our study, Francois et al., study also shows, the significant difference in mean blood loss in group A (UBT group) is less compared to group B (256 mL vs 545 mL) with a p value <0.01.[51]
- Dumont et al., shows that tamponade group has less total blood loss compared to misoprostol group, with a statistically significant difference (P<0.01).[43]
- Another studies conducted by Rathore[48], Thappa[52] and Condous[53] studies shows mean total blood loss between the study groups from 1.2 litre to 3.1 litre, the observed difference could be due to quantification of blood

loss is different. Kinugasa case report shows that blood loss cannot be stopped by giving oxytocin alone.[44]

- A prospective study by Sharvari shows that the median blood loss among the patients ranges from 850 to 3500ml. In contrast to our study, they doesn't have control group to compare the difference. Contrary to the results we found, Patrick study found no substantial significant difference in the blood loss between UBT group and control groups.[54] Variations in the patient demographics, resources of hospital and timing of treatment may be the cause of this observed disparity.
- This study measured the blood loss before delivery and after delivery at 3 points (5min, 10 min and 1 hour) at all points in the group A showed substantial reduction in blood loss than the group B. Francois study also showed an significant reduction in blood loss after 15 min of insertion of UBT.[51] Burkes et al, study also shows that ESM UBT acted as effective tool in reduction of haemorrhage among women.[36]
- The ESM-UBT acts very quickly and immediately gives mechanical compression of uterine walls in order to reduce the bleeding this could be the observed difference.
- In this study there is an significant difference in Blood in V drape when compared with group A and group B which is 90 ml and 250ml of median blood, with a p value of <0.01.
- The study conducted by Singh et al., says that Blood loss measured in brass v drape is 213.57 ±79.08 ml which is an gold standard method to see blood loss in the patients, but visual estimation is easy and quick.[55]

The uses of ESM UBT will potentially reduce the blood loss and it will be crucial to manage PPH to implement safe, effective, and readily applicable procedures in every unit. Laparotomy with uterine, "utero-ovarian or hypogastric artery ligation, or even hysterectomy" are regarded as surgical options in the past when uterine massage, uterotonics, curettage, and laceration

changes failed to prevent severe bleeding.[46] All of these methods, however, poses some risks and require a team of skilled persons and tools. Women who are wish to maintain their fertility may choose to have a hysterectomy, a severe procedure, to decrease bleeding.

Present study showed an significant less weight difference between weight of the guaze pads when group A (30 grams) is compared to group B (50grams). This shows that ESM UBT is effective in controlling the blood loss among the patients.

- Hemoglobulin before and after 24 hours of delivery was measured in this study, which shows an statistically significant difference between groups. Median Hb before delivery in group A is 10.8 (9.2-12) g/dl vs 9.9 (9.3-11.6) g/dl in group B whereas 24 hours post-delivery is 10.1(9-11.2) and 9.9 (7.9-10.5) g/dl. Haemoglobin level were usually lowered by an substantial loss of blood, but there is no much reduction in the group A compared to group B which says that ESM-UBT reduced the postpartum haemorrhage among patients.
- Other blood components like MCV,MCH, platelets and WBC doesn't show statistically significant difference among the study participants except PCV.
- Inline with our study Laas et al., study showed that there is no substantial decrease in Hb level after UBT introduction compared with before UBT group.[56]
- In this study more patients required blood component transfusion among group B compared to group A with a p value <0.01, similarly other studies like Tabet[58] and Maher[57] studies shows that number of blood transfusion is reduced in UBT group compared no UBT group. Kavak study says that blood transfusion was required more PPH patients.[46]
- In contrast to our findings Rupali study was given to 97% of the patients with UBT compared to control. The variability could be due to difference

in study setting.[40] Dumont study also shows that more numbers of patients required transfusion in UBT group.[43] The observed difference could be due to usage of different treatments. A case report by Kinugasa also shows that they required blood transfusion in managing PPH. ESM-UBT can reduce the blood transfusion requirement, but the patient demographic and severity of haemorrhage are demanding factors for blood transfusion. [44]

- Additional uterotonics are significant less numbers of patients were used in group A compared to group B.
- In contrast, According to Rupali et al., 97% of patients treated with UBT still needed further uterotonics, suggesting that tamponade may not always be enough. [40] In addition, Kinugasa's case report emphasised the need for uterotonics in addition to UBT for effective haemorrhage management.[44] These results indicate that although UBT is a useful technique for minimising blood loss and minimising the need for extra uterotonics, its effectiveness may differ depending on the patient's reaction and the extent of the haemorrhage. For PPH patients, a multimodal strategy that combines pharmacological and mechanical therapy is still essential to maximising results.
- In this study, a significant difference was seen in group B patients received a greater number of iron supplementations compared to group A.
- The discrepancy may be attributed to variations in patient populations, surgical techniques, or protocols used in the different studies.
- The findings from our study and the evidence presented in several other studies support the idea that adding ESM_UBT + Oxytocin can yield favourable outcomes regarding reduction PPH and reduced requirement of blood transfusion in the early recovery period. Our study, comparing Group A (Burke’s ESM-UBT+ I.M Oxytocin) and Group B (I.M Oxytocin), demonstrated that Group A consistently required less blood

loss at various intervals, indicating better management of PPH than Group B.

- In our study, the mean age of the participants in the present study was found to be 29.5 (±4.9) years. Systematic review conducted by Sebastian et al., burke et la study shows an age range of 27 to 32 years.[59]
- Most of the participants gestational period is between 38 weeks to 40 weeks. Similarly to Rupali study 37-40 weeks.[40]
- In present study 13.3% in group A and 23.9% in group B had vaginal deliveries. Similarly martin study also shows an 50% had vaginal deliveries.[49] 100% vaginal deliveries were seen in Dumont study.[43] Burke study recorded 62.3% in intervention group and 63% in control group.[38]
- Seventy one percent had multiple pregnancies in group A compared to 78.8% in group B. More than 50 % patients had 2 or more preterm deliveries and 40% had 2 or more living children in group A whereas 47 % patients had 2 or more preterm deliveries and 36% had 2 or more living children in group b. Similarly multiparity observed in Dumont study and Rupali study. [43,40]
- Similar to other studies and other demographic profiles and BP, pulse rate compared between the two groups was statistically insignificant.
- Many patients had more than one risk factor. The risk factors for atonic PPH among the study groups are assessed 24.7% of patients had PIH in group A and 24.7% in group b. Abruption is seen in 4.5% and 6.2%, Antepartum Eclampsia 7.0 and 5.3, polyhydramnios 0.8 in each group, twin pregnancy 3.5 and 6.2, Gestational DM 3.5 and 6.2. In Group A 33.6% had moderate anemia and 36.3% in group B. Similar risk factors observed in Rupali study[40], 35 patients had anemia, 43 patients had preeclampsia. Overdistention of uterus due to multiple gestation and other risk factors contributes to uterus atony.

CONCLUSION

CONCLUSION

The Present study shows the significant benefits of using ESM-UBT with IM Oxytocin in reduction of blood loss, additional uterotonics, and blood component transfusions in high-risk pregnancies. The study findings support the idea of incorporating ESM-UBT into routine practice of Post partum hemorrhage management, specifically in resource-constricted settings, to increase the outcomes of maternal health. Because of its effectiveness, affordability, and convenience of use, including ESM-UBT into standard obstetric care particularly in healthcare setting with limited resource can be crucial to reaching international maternal health objectives like Sustainable development goal 3 which is reaching targeted India maternal mortality ratio 70 per 1lakh birth by 2030 . The Maternal mortality can be significantly reduced by incorporating the ESM-UBT to all levels of care particularly in basic healthcare centres and community health center areas. Extended research and more clinical trials are needed to corroborate these findings and refine best practices in obstetric management.

SUMMARY

SUMMARY

1. Majority of the study population 46% fell within the age group of 21-25 years. The mean age of our study population was 29.5±4.9 years
2. The most prevalent gestational age at delivery was between 38 weeks + 1 day and 40 weeks, with the largest percentage of participants (45%) having this gestational age.
3. There were 226 participants in the study, divided between a Group B (control group) and the Group A (intervention group).
4. Gravida status, 25.6% of participants were primigravida intervention group and 16.8% in the control group,
5. 27.4% of patients in the group B and 33% of participants in the intervention group had no prior history of preterm birth.
6. The premature delivers are 47% of the control group and 50% of the intervention group.
7. 40% of participants in the intervention group and 36.3% of participants in the control group have living child. The majority of participants had never undergone an abortio. C section was observed in 30% of e control group and 42.8% in intervention group. 46.1% of the control group and 44.2% of the intervention group had experienced two or more vaginal births.
8. Vital signs were measured, the intervention group's mean pulse rate was 89.2 bpm, whereas the control group's was 90.1 bpm. The intervention group's diastolic blood pressure was 81.1 mmHg, while the control group's was 82.0 mmHg. The mean systolic blood pressure was 124.6 mmHg and 126.4 mmHg, respectively. With a mean of 131.2 bpm, the intervention group's fetal heart rate (FHR) was marginally higher than the control group's, which had a mean of 128.0 bpm.
9. Risk factors were recorded accordingly In both the intervention and control groups, 24.7% of participants had pregnancy-induced

hypertension (PIH). The antepartum eclampsia was reported in 7% in Group A and 5% in Group B. 0.8% of participants in both groups experienced polyhydramnios, gestational diabetes mellitus (GDM) was reported at (3.5% vs. 6.2%), twin pregnancies were observed in 3.5% of the intervention group and 6.2% of the control group.

10. Anemia, 56.6% of the control group and 61% of the intervention group were anemia-free. Moderate anemia was found in 33.6% of the intervention group and 36.3% of the control group, although mild anemia was recorded in 1.7% of both groups. 5.4% of the control group and 3.6% of the intervention group had severe anemia. Furthermore, thrombocytopenia was noted in 4.3% of the control group and 6.2% of the intervention group.
11. Median Blood in Brass V drape is 90 mL (60-210) in group A and in group B is 250 mL (130–360 mL) with a p value <0.01
12. Median weight of the gauze pads 30 grams (20-50) in group A and in group B is 50 grams (30–90) with a p value <0.01
13. Median blood loss 120 mL (80-260) in group A and in group B is 320 mL (190–440 mL) with a p value <0.01
14. The intervention group lost a median of 20ml before delivery, after delivery 5 min, 10 min and 1 hour, the blood loss is 50 ml,30ml and 20ml whereas in group B i.e control group is 30ml before delivery followed by 150ml 5min delivery and 80ml and 50 ml 10min and 1 hour after delivery.
15. Significant difference in Heart rate was observed between groups at different point before delivery, 5min, 10min and 1 hour after delivery.
16. No Significant difference in Systolic blood pressure rate was observed between groups at different point before delivery, 5min, 10min and 1 hour after delivery.

17. No Significant difference in Diastolic blood pressure rate was observed between groups at different point before delivery, 5min, 10min and 1 hour after delivery.
18. Hb before delivery values 10.8g/dl in group A and 9.9 g/dl in group B with a p value <0.09. Hb 24hour delivery values 10.1g/dl in group A and 9.9 g/dl in group B with a p value <0.007.
19. When compared other blood components only PCV showed significant difference between groups before and after delivery. Rest measurements like MCV, MCH, WBC, platelets shows no significant difference.
20. P-value of 0.003, the intervention group had a significantly lower number of participants who needed extra uterotonics 9 , as compared to the control group which is 25.
21. With only one participant in each group, both groups used styptics sparingly, and the p-value of 1
22. 33 patients required blood transfusion in group A and 50 in group B, p value 0.01

LIMITATIONS:

1. The relatively small sample size of 226 patients may limit the findings' generalizability to a larger population. higher sample size gives more statistical power and improve the validity of the study.
2. Conducting the research in a single center restricts the generalizability of its findings to broader and more diverse populations.
3. There was no placebo control group, which would have added more proof of ESM_UBT alone particular effect on PPH.
4. Healthcare practices, patient demographics, and resource availability can vary significantly across regions, which may affect the applicability of these results in different settings.
5. Despite the study's strong inclusion requirements, some patients who were not included may still benefit from this approach.

REFERENCES

1. Maternal mortality. Available from: https://www.who.int/news-room/fact-sheets/detail/maternal-mortality
2. Corbetta-Rastelli CM, Friedman AM, Sobhani NC, Arditi B, Goffman D, Wen T. Postpartum Hemorrhage Trends and Outcomes in the United States, 2000-2019. Obstet Gynecol. 2023 Jan 01;141(1):152-161.
3. Montgomery AL, Ram U, Kumar R, Jha P. Maternal mortality in India: causes and healthcare service use based on a nationally representative survey. PLoS ONE. 2014;9(1):e83331.
4. 4. Kumar N. Postpartum hemorrhage; a major killer of woman: review of current scenario. Obstet Gynecol Int J. 2016;4(4):130–134.
5. Begley CM, Gyte GM, Murphy DJ, Devane D, McDonald SJ, McGuire W. Active versus expectant management for women in the third stage of labour. Cochrane Database Syst Rev. 2010;7:CD007412.
6. World Health Organization . WHO recommendations for the prevention and treatment of postpartum haemorrhage. 2012.
7. Santhanam R, Viswanathan RM, Priya V. Condom tamponade in the management of atonic postpartum hemorrhage .Int J Reprod Contracept Obstet Gynecol. 2018; 7(6): 2276-82.
8. Carroli G, Cuesta C, Abalos E, Gulmezoglu AM. Epidemiology of postpartum haemorrhage: a systematic review. Best practice & research Clinical obstetrics & gynaecology. 2008 Dec 1;22(6):999-1012.
9. Committee on Practice Bulletins-Obstetrics. Practice Bulletin No. 183: Postpartum Hemorrhage. Obstet Gynecol. 2017 Oct;130(4):e168-e186
10. American College of Obstetricians and Gynecologists. ACOG Practice Bulletin: Clinical Management Guidelines for Obstetrician-Gynecologists Number 76, October 2006: postpartum hemorrhage. Obstet Gynecol. 2006 Oct;108(4):1039-47.
11. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller A-B, Daniels J, et al. Global

causes of maternal death: a WHO systematic analysis. Lancet Global Health 2014;2(6):e323-333.

12. Carroll M, Daly D, Begley CM. The prevalence of women's emotional and physical health problems following a postpartum haemorrhage: a systematic review. BMC Pregnancy Childbirth 2016;16(1):261.
13. Tindell K, Garfinkel R, Abu-Haydar E, et al. Uterine balloon tamponade for the treatment of postpartum haemorrhage in resource-poor settings: a systematic revie w. BJOG. 2013;120(1):5-14.
14. Suarez S, Conde-Agudelo A, Borovac-Pinheiro A, et al. Uterine balloon tamponade for the treatment of postpartum hemorrhage: a systematic review and meta-analysis. Am J Obstet Gynecol. 2020;222(4):293.e1-293.e52.
15. World Health Organization . WHO recommendations for the prevention and treatment of postpartum haemorrhage. 2012. Available from: http://www.myilibrary.com?id=1003393
16. Oliveira MI, da Costa VS, Mer S, Osório J, Martins AP. Thrombocytopenia in pregnancy, a challenge in the intensive care unit (ICU). Rev Esp Anestesiol Reanim (Engl Ed). 2019 Aug-Sep;66(7):385-389.
17. Alemu FM, Fuchs MC, Martin Vitale T, Abdalla Mohamed Salih M. Severe maternal morbidity (near-miss) and its correlates in the world's newest nation: South Sudan. Int J Womens Health. 2019;11:177-190.
18. Lin L, Chen YH, Sun W, Gong JJ, Li P, Chen JJ, Yan H, Ren LW, Chen DJ. Risk factors of obstetric admissions to the intensive care unit: An 8-year retrospective study. Medicine (Baltimore). 2019 Mar;98(11):e14835.
19. Changede P, Chavan N, Raj N, Gupta P. An Observational Study to Evaluate the Maternal and Foetal Outcomes in Pregnancies Complicated with Jaundice. J Obstet Gynaecol India. 2019 Feb;69(1):31-36.
20. Federspiel JJ, Eke AC, Eppes CS. Postpartum hemorrhage protocols and benchmarks: improving care through standardization. Am J Obstet Gynecol MFM. 2023 Feb;5(2S):100740.

21. Bienstock JL, Eke AC, Hueppchen NA. Postpartum Hemorrhage. N Engl J Med. 2021 Apr 29;384(17):1635-1645.
22. Committee on Practice Bulletins-Obstetrics. Practice Bulletin No. 183: Postpartum Hemorrhage. Obstet Gynecol. 2017 Oct;130(4):e168-e186.
23. Bienstock JL, Eke AC, Hueppchen NA. Postpartum Hemorrhage. N Engl J Med. 2021 Apr 29;384(17):1635-1645.
24. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: A systematic review. Lancet. 2006;367(9516):1066–74.
25. Leduc D, Senikas V, Lalonde AB; SOGC. Active management of the third stage of labor: Prevention and management of postpartum hemorrhage. J Obstet Gynaecol Can. 2009;31(10):980–93.
26. Burke TF, King J, Abdelwahab S, et al. Every Second Matters for Mothers and Babies (ESM-UBT) package: A low-cost, non-surgical solution for managing postpartum hemorrhage. Global Health Action. 2018;11(1):1563806. doi:10.1080/16549716.2018.1563806
27. Massachusetts General Hospital. Every Second Matters for Mothers and Babies – Uterine Balloon Tamponade (ESM-UBT) Package [Internet]. Boston: Global Health Innovation Lab; 2023
28. McKinlay A, Scott J, McGrath R. The role of oxytocin in childbirth and breastfeeding: A comprehensive review. J Obstet Gynecol. 2022;48(1):26–33.
29. Lee H, Johnson C, Savitz D, et al. Mechanisms of uterine contraction by oxytocin and its impact on labor progression. Am J Obstet Gynecol. 2020;223(4):531–40.
30. Morison R. The physiology of milk ejection and its role in breastfeeding. Breastfeed Med. 2021;16(2):101–9.

31. Ghorbani Z, Mirghafourvand M. The efficacy and safety of intravaginal oxytocin on vaginal atrophy: A systematic review. Post Reprod Health. 2021 Mar;27(1):30-41.
32. Gallos ID, Papadopoulou A, Man R, Athanasopoulos N, Tobias A, Price MJ, Williams MJ, Diaz V, Pasquale J, Chamillard M, Widmer M, Tunçalp Ö, Hofmeyr GJ, Althabe F, Gülmezoglu AM, Vogel JP, Oladapo OT, Coomarasamy A. Uterotonic agents for preventing postpartum haemorrhage: a network meta-analysis. Cochrane Database Syst Rev. 2018 Dec 19;12(12):CD011689.
33. Bhargava R, Daughters KL, Rees A. Oxytocin therapy in hypopituitarism: Challenges and opportunities. Clin Endocrinol (Oxf). 2019 Feb;90(2):257-264.
34. Simpson KR. Considerations for Active Labor Management with Oxytocin: More May Not be Better. MCN Am J Matern Child Nurs. 2020 Jul/ Aug;45(4):248.
35. Posever N, Sipahi S, Shivkumar PV, Burke TF. Every Second Matters - uterine balloon tamponade implementation across ten medical colleges in Maharashtra and Madhya Pradesh in India: A qualitative study. Int J Gynaecol Obstet. 2022 Dec;159(3):817-824.
36. Burke TF, Shivkumar PV, Priyadarshani P, Garg L, Conde-Agudelo A, Guha M. Impact of the introduction of a low-cost uterine balloon tamponade (ESM-UBT) device for managing severe postpartum hemorrhage in India: A comparative before-and-after study. Int J Gynaecol Obstet. 2022 Nov;159(2):466-473.
37. Nipanal HV, Talawar SR. Efficacy of Intrauterine Balloon Tamponade by 24-French Foley Catheter in Prevention of Postpartum Hemorrhage. J South Asian Feder Obst Gynae. 2022;14(6): 649–652.

38. Lothe SM, Bhalerao A. Condom-based uterine balloon tamponade: An innovation in the management of postpartum hemorrhage. J South Asian Feder Obstet Gynaecol. 2022;10.5005.
39. Liu C, Gao J, Liu J, Wang X, He J, Sun J, et al. Predictors of failed intrauterine balloon tamponade in the management of severe postpartum hemorrhage. Front Med. 2021;8:656422.
40. Gaikwad RA, Gadappa SN. Intrauterine balloon tamponade in the management of atonic postpartum haemorrhage: case study from a tertiary care hospital. The New Indian Journal of OBGYN. 2021; 7(2): 148-52.
41. Ramanathan A, Eckardt MJ, Nelson BD, Guha M, Oguttu M, Altawil Z, Burke T. Safety of a condom uterine balloon tamponade (ESM-UBT) device for uncontrolled primary postpartum hemorrhage among facilities in Kenya and Sierra Leone. BMC Pregnancy Childbirth. 2018 May 15;18(1):168.
42. Mishra A. Efficacy of balloon tamponade in the management of postpartum hemorrhage: A clinical study. Int J Clin Obstet Gynaecol. 2018;2(1):7–9.
43. Dumont A, Bodin C, Hounkpatin B, Popowski T, Traoré M, Perrin R, Rozenberg P. Uterine balloon tamponade as an adjunct to misoprostol for the treatment of uncontrolled postpartum haemorrhage: a randomised controlled trial in Benin and Mali. BMJ Open. 2017 Sep 1;7(9):e016590.
44. Kinugasa M, Tamai H, Miyake M, Shimizu T. Uterine balloon tamponade in combination with topical administration of tranexamic acid for management of postpartum hemorrhage. Case Rep Obstet Gynecol. 2015;2015:195036.
45. Martin E, Legendre G, Bouet P-E, Cheve M-T, Multon O, Sentilhes L. Maternal outcomes after uterine balloon tamponade for postpartum hemorrhage. Acta Obstet Gynecol Scand. 2015; 94: 399–404.
46. Kavak SA, Kavak EÇ, Demirel İ, Ilhan R. Therapeutics and Clinical Risk Management. 2014;10:615–620.

47. Tirumuru S, Saba S, Morsi H, Muammar B. Intrauterine balloon tamponade in the management of severe postpartum hemorrhage: A case series from a busy UK district general hospital. Open Journal of Obstetrics and Gynecology. 2013;3:131–136.
48. Rathore AM, Gupta S, Manaktala U, Gupta S, Dubey C, Khan M. Uterine tamponade using condom catheter balloon in the management of non-traumatic postpartum hemorrhage. J Obstet Gynaecol Res. 2012 Sep;38(9):1162-7.
49. Ishii T, Sawada K, Koyama S, Isobe A, Wakabayashi A, Takiuchi T, Kanagawa T, Tomimatsu T, Ogita K, Kimura T. Balloon tamponade during cesarean section is useful for severe post-partum hemorrhage due to placenta previa. J Obstet Gynaecol Res. 2012 Jan;38(1):102-7.
50. Bakri Y, Arulkumaran S. Intrauterine balloon tamponade for control of postpartum hemorrhage, UpToDate, 2017.
51. Futcher F, Moufawad G, Centini G, Hayek J, Tarchichi J, Bakar J, Habib N. Intrauterine Tamponade Balloon for Management of Severe Postpartum Haemorrhage: Does Early Insertion Change the Outcome? A Retrospective Study on Blood Loss. J Clin Med. 2023;12(17):5439.
52. Thapa K, Malla B, Pandey S, Amatya S. Intrauterine condom tamponade in management of postpartum hemorrhage. J Nepal Health Res Counc 2010; 8: 19–22.
53. Condous GS, Arulkumaran S, Symonds I, Chapman R, Sinha A, Razvi K. The ‘tamponade test’ in the management of massive postpartum hemorrhage. Obstet Gynecol 2003; 101: 767–772.
54. Rozenberg P, Sentilhes L, Goffinet F, Vayssiere C, Senat MV, Haddad B, Morel O, Garabedian C, Vivanti A, Perrotin F, Kayem G, Azria E, Raynal P, Verspyck E, Sananes N, Gallot D, Bretelle F, Seco A, Winer N, Deneux-Tharaux C; Groupe de Recherche en Obstétrique et Gynécologie. Efficacy of early intrauterine balloon tamponade for immediate postpartum hemorrhage

after vaginal delivery: a randomized clinical trial. Am J Obstet Gynecol. 2023;229(5):542.e1-542.e14.

55. Singh G, Singh V, Sasidharan S, Singh S, Nasser A, Dhillon H. A comparative study of Brass-V Drape and standardised visual estimation of blood loss during vaginal delivery - a single-observer study. J Obstet Gynecol Investig. 2020;3:1-9.

56. Laas E, Bui C, Popowski T, Mbaku OM, Rozenberg P. Trends in the rate of invasive procedures after the addition of the intrauterine tamponade test to a protocol for management of severe postpartum hemorrhage. Am J Obstet Gynecol 2012;207(4):281.e281–7.

57. Maher MA, Abdelaziz A. Comparison between two management protocols for postpartum hemorrhage during cesarean section in placenta previa: balloon protocol versus nonballoon protocol. J Obstet Gynaecol Res 2017;43(3):447–55.

58. Thabet M, Abdelhafez MS, Fyala EA. Intrauterine inflated Foley's catheter balloon in the management of abnormally invasive placenta previa: a case-control study. J Obstet Gynaecol India.2018;68(3):185–91.

59. Suarez S, Conde-Agudelo A, Borovac-Pinheiro A, Suarez-Rebling D, Eckardt M, Theron G, et al. Uterine balloon tamponade for the treatment of postpartum hemorrhage: a systematic review and meta-analysis. Am J Obstet Gynecol. 2020;222(4):293.e1-293.e52.

ANNEXURE VII

B.L.D.E. (DEEMED TO BE UNIVERSITY)

SHRI B.M.PATIL MEDICAL COLLEGE HOSPITAL AND RESEARCH CENTER, VIJAYAPURA-586103

INFORMED CONSENT FOR PARTICIPATION IN DISSERTATION/

RESEARCH

I, the undersigned, _____, S/O D/O W/O _____, aged ____ years, ordinarily resident of _____, do hereby state/declare that DR.D. SANTHOSHI of Shri. B. M. Patil Medical College Hospital and Research Centre have examined me thoroughly on _____ at _____ (place), and it has been explained to me in my own language that I am suffering from _____ disease (condition), and this disease/condition mimic following diseases. Further, Dr. D. SANTHOSHI informed me that he/she is conducting a dissertation/research titled A COMPARATIVE STUDY OF SAFETY AND EFFICACY OF PROPHYLACTIC INSERTION OF DR. BURKE'S EVERY SECOND MATTERS-UTERINE BALLOON TAMPONADE (ESM-UBT) WITH I.M OXYTOCIN VS ONLY I.M OXYTOCIN FOR PREVENTION OF ATONIC PPH IN WOMEN AT RISK OF UTERINE ATONY under the guidance of DR. RAJASRI.G. YALIWAL requesting my participation in the study. Further Doctor has informed me that my participation in this study will help in the evaluation of the results of the study, which is a useful reference for the treatment of other similar cases in the near future.

The Doctor has also informed me that information given by me, observations made/ photographs/ video graphs taken upon me by the investigator will be kept secret and not assessed by a person other than my legal hirer or me except for academic purposes.

The Doctor did inform me that though my participation is purely voluntary, based on the information given by me, I can ask for any clarification during treatment/study related to diagnosis, the procedure of treatment, result of treatment, or the prognosis.

At the same time, I have been informed that I can withdraw from my participation in this study at any time if I want, or the investigator can terminate me from the study at

any time the study but not the procedure of treatment and follow-up unless I request to be discharged.

After understanding the nature of the dissertation or research, the diagnosis made, and mode of treatment. I am giving consent for the investigations.

I, the undersigned Shri/Smt _____, under my full conscious state of mind, agree to participate in the said research/dissertation.

Signature of the patient:

Signature of Doctor:

Witness: 1.

2.

Date:

Place:

B.L.D.E (DEEMED TO BE UNIVERSITY) ಶ್ರೀ ಬಿ.ಎಂ.ಪಟ್ಟಣಶೆಟ್ಟಿ ಮೆಡಿಕಲ್ ಕಾಲೇಜು, ಆಸ್ಪತ್ರೆ ಮತ್ತು ಸಂಶೋಧನಾ ಕೇಂದ್ರ, ವಿಜಯಪುರ-**586103**

ಪ್ರಬಂಧ/ಸಂಶೋಧನೆಯಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಲು ಮಾಹಿತಿ ಪಡೆದ ಸಮ್ಮತಿ

ನಾನು, ಕೆಳಗಿನವರು_____ ಸಹಿಯಿಟ್ಟವರು, ಮಗ/ಮಗಳು/ಪತ್ನಿಯ _____ ವಯಸ್ಸು _____ವರ್ಷಗಳು, ಸಾಮಾನ್ಯವಾಗಿ ನಿವಾಸಿಸುವ ಸ್ಥಳದ ಹೆಸರು_____, ಇಲ್ಲಿ ಹೇಳಿದ್ದೇನೆ/ ಘೋಷಿಸುತ್ತೇನೆ ಡಾಕ್ಟರ್ ಹೆಸರು_____ ಅವರು ಆಸ್ಪತ್ರೆ ಹೆಸರು_____ ಅವರು ನನ್ನನ್ನು ಪೂರ್ಣವಾಗಿ ಪರೀಕ್ಷಿಸಿದರು ದಿನಾಂಕದಲ್ಲಿ_____ ಸ್ಥಳ ಹೆಸರು_____ ಮತ್ತು ನನಗೆ ನನ್ನ ಭಾಷೆಯಲ್ಲಿ ವಿವರಿಸಲಾಗಿದೆ ನಾನು ಒಂದು ರೋಗ (ಸ್ಥಿತಿ) ಅನುಭವಿಸುತ್ತಿದ್ದೇನೆ. ಮುಂದುವರಿದು ಡಾಕ್ಟರ್ ನನಗೆ ತಿಳಿಸಿದ್ದಾರೆ ಅವರು ಒಂದು ಪದ್ಧತಿ/ಸಂಶೋಧನೆ ನಡೆಸುತ್ತಿದ್ದಾರೆ ಶೀರ್ಷಿಕೆಯುಳ್ಳ_____ ಡಾಕ್ಟರ್_____ ಮಾರ್ಗದರ್ಶನದಲ್ಲಿ ನನ್ನ ಪಾಲ್ಗೊಳ್ಳುವಿಕೆಯನ್ನು ಕೇಳಿದ್ದಾರೆ ಅಧ್ಯಯನದಲ್ಲಿ.

ಡಾಕ್ಟರ್ ನನಗೆ ಇದನ್ನು ಕೂಡಾ ತಿಳಿಸಿದ್ದಾರೆ ಈ ಕ್ರಮದ ನಡೆವಲ್ಲಿ ಪ್ರತಿಕೂಲ ಫಲಿತಾಂಶಗಳನ್ನು ಎದುರಿಸಬಹುದು. ಮೇಲೆ ಹೇಳಿದ ಪ್ರಕಟಣೆಗಳಲ್ಲಿ, ಅಧಿಕಾಂಶವು ಚಿಕಿತ್ಸಿಸಬಹುದಾದರೂ ಅದನ್ನು ನಿರೀಕ್ಷಿಸಲಾಗುತ್ತಿಲ್ಲ ಆದ್ದರಿಂದ ನನ್ನ ಸ್ಥಿತಿಯ ಹಿರಿದಾಗುವ ಅವಕಾಶವಿದೆ ಮತ್ತು ಅಪರೂಪದ ಸಂದರ್ಭಗಳಲ್ಲಿ ಅದು ಮರಣಕಾರಕವಾಗಿ ಪರಿಣಮಿಸಬಹುದು ಹೊಂದಿದ ರೋಗನಿರ್ಧಾರ ಮತ್ತು ಯಥಾಶಕ್ತಿ ಚಿಕಿತ್ಸೆ ಮಾಡಲು ಹೊಂದಿದರೂ. ಮುಂದುವರಿದು ಡಾಕ್ಟರ್ ನನಗೆ ತಿಳಿಸಿದ್ದಾರೆ ನನ್ನ ಪಾಲ್ಗೊಳ್ಳುವಿಕೆ ಈ ಅಧ್ಯಯನದ ಫಲಿತಾಂಶಗಳ ಮೌಲ್ಯಮಾಪನದಲ್ಲಿ ಸಹಾಯಕವಾಗುತತ್ತದೆ ಇತರ ಸಮಾನ ಪ್ರಕರಣಗಳ ಚಿಕಿತ್ಸೆಗೆ ಉಪಯುಕ್ತ ಉಲ್ಲೇಖವಾಗಿದೆ, ಮತ್ತು ನಾನು ಅನುಭವಿಸುವ ರೋಗದಿಂದ ವಿಮುಕ್ತಿ ಅಥವಾ ಗುಣಮುಖಿಗೊಳ್ಳುವಲ್ಲಿ ನನಗೆ ಪ್ರಯೋಜನವಾಗಬಹುದು.

ಡಾಕ್ಟರ್ ನನಗೆ ಇದನ್ನು ಕೂಡಾ ತಿಳಿಸಿದ್ದಾರೆ ನನ್ನಿಂದ ನೀಡಿದ ಮಾಹಿತಿ, ಮಾಡಿದ ಪರಿಶೀಲನೆಗಳು / ಫೋಟೋಗ್ರಾಫ್‌ಗಳು / ವೀಡಿಯೋ ಗ್ರಾಫ್‌ಗಳು ನನ್ನ ಮೇಲೆ ತೆಗೆದುಕೊಳ್ಳಲಾಗುವ ಅನ್ವೇಷಕರು ರಹಸ್ಯವಾಗಿ ಇಡುವರು ಮತ್ತು ನಾನು ಅಥವಾ ನನಗೆ **ಕಾನೂನು ದೃಷ್ಟಿಯಲ್ಲಿ ಸಂಬಂಧಿತ**rannu ಹೊರತುಪಡಿಸಿ ಇತರ ವ್ಯಕ್ತಿಯಿಂದ ಮೌಲ್ಯಮಾಪನ ಮಾಡಲಾಗುವುದಿಲ್ಲ. ಡಾಕ್ಟರ್ ನನಗೆ ತಿಳಿಸಿದ್ದಾರೆ ನನ್ನ ಪಾಲ್ಗೊಳ್ಳುವಿಕೆ ಶುದ್ಧವಾಗಿ ಸ್ವೇಚ್ಛಾಯಿತ, ನನ್ನಿಂದ ನೀಡಿದ ಮಾಹಿತಿಯ ಆಧಾರದ ಮೇಲೆ, ಚಿಕಿತ್ಸೆ / ಅಧ್ಯಯನದ ಸಂಬಂಧದಲ್ಲಿ ರೋಗನಿರ್ಧಾರ, ಚಿಕಿತ್ಸೆಯ ವಿಧಾನ, ಚಿಕಿತ್ಸೆಯ ಫಲಿತಾಂಶ ಅಥವ ಆ ಭವಿಷ್ಯದ ಪ್ರವೃತ್ತಿಗಳು ಬಗ್ಗೆ ಯಾವುದೇ ಸ್ಪಷ್ಟತೆ ಕೇಳಬಹುದು. ಅದೇ ಸಮಯದಲ್ಲಿ **ನನಗೆ** ತಿಳಿಸಲಾಗಿದೆ ನಾನು ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ಈ ಅಧ್ಯಯನದಲ್ಲಿ ನನ್ನ ಪಾಲ್ಗೊಳ್ಳುವಿಕೆಯನ್ನು ನಿಲ್ಲಿಸಬಹುದು ನಾನು ಬಯಸಿದರೆ ಅಥವಾ ಅನ್ವೇಷಕರು ಅಧ್ಯಯನದಿಂದ ಯಾವುದೇ ಸಮಯದಲ್ಲಿ ನನ್ನನ್ನು ನಿಲ್ಲಿಸಬಹುದು.

ಪ್ರಬಂಧ ಅಥವಾ ಸಂಶೋಧನೆಯ ಸ್ವಭಾವ, ಮಾಡಿದ ರೋಗನಿರ್ಧಾರ ಮತ್ತು ಚಿಕಿತ್ಸೆಯ ವಿಧಾನವನ್ನು ಅರ್ಥಮಾಡಿಕೊಂಡು, ನಾನು ಕೆಳಗಿನ ಶ್ರೀ / ಶ್ರೀಮತಿ_____ ನನ್ನ ಪೂರ್ಣವಾದ ಪ್ರಜ್ಞೆಯ ಸ್ಥಿತಿಯಲ್ಲಿ ಹೇಳಿದ ಸಂಶೋಧನೆ / ಪ್ರಬಂಧದಲ್ಲಿ ಪಾಲ್ಗೊಳ್ಳಲು ಒಪ್ಪುತ್ತೇನೆ.

ರೋ ಗಿ ಯ ಸ ಹಿ
ಡಾಕ್ಟರನ ಸಹಿ

ಸಾಕ್ಷಿಗಳು
1)
2)

ANNEXURE – VIII

SHRI B.M. PATIL MEDICAL COLLEGE, HOSPITAL AND RESEARCH CENTRE, VIJAYAPURA– 586103

PROFORMA

Type of intervention: Group I (ESM-UBT with IM Oxytocin) /Group II (IM Oxytocin only)

CASE NO. :

NAME :

AGE: IP NO: DATE OF ADMISSION:

DATE OF STUDY:

Married life –

Obstetrics score: G P L A PERIOD OF GESTATION:

1.

2.

3.

4.

Past History:

Family History:

Personal History:

Vitals on admission:

PR:_____ BP:_____

Per abdomen:

Fundal height [GA]:
Presentation:
FHS:
Per Vaginum Examination

Any antenatal or intrapartum complication.

- PIH
- Abruption
- Antepartum eclampsia
- Polyhydramnios
- Twins
- Diabetes GDM
- Anaemia: mild/moderate/severe
- Any other_____`_____-

Type of intervention Group I/GroupII

Amount of blood collected in Brass V drape-

Weight of gauze/pads used –

Total blood loss

Heart rate and blood pressure before and after intervention

Timing	Heart rate	Systolic Blood Pressure	Diastolic Blood Pressure	Amount of blood loss
Just before delivery				
At 5 minutes after delivery				
At 10 minutes After delivery				
At 1 hour after delivery				

Pain at insertion site YES/NO

Use of additional uterotonics.

If yes

- The drug used, dose and route _____
- Use of any styptics

  Yes/No

  If yes
- Drugs used, dose and route. _____

Blood and component Transfusion

Yes/No

If Yes

- No. Of Pints of whole blood _____
- No. Of Pints of PCV _____

CBCcomponents	Pre-delivery values	Post-delivery values after 48hrs
Hb		
PCV(HCT)		
MCV		
MCHC		
Plateletcount		
WBCTotalCount		

-
-

S.no	Intervention	IP Number	Age	Period of gestation	Labour status	Any antenatal/intrapartum complication	Blood in drape	weight of gauze pads	Total blood loss	Blood loss just before delivery	blood loss at 5min after delivery	blood loss at 10min after delivery	blood loss at 1hour after delivery	Pain at insertion site	use of oral additionals	Blood component transfusion	Spontaneous expulsion	HB before delivery	HB post delivery 24hrs	PCV before delivery	PCV post delivery 24hrs	MCV before delivery	MCV post delivery 24hrs	MCH before delivery	MCHC post delivery 24hrs	Platelet count before delivery	Platelet count post delivery 24hrs	WBC count before delivery	WBC post delivery 24hrs
1	1	398113	33	39+5	YES	YES	300	50	350	50	200	50	50	NO	NO	YES	NO	8.6	10.4	27	32.7	83.9	84.9	31.9	31.8	219	212	7.53	8.95
2	1	181957	24	35+6	YES	YES	250	50	300	50	200	20	30	NO	NO	NO	YES	12.8	11.2	35.4	31.2	79.2	80.4	36.1	35.9	234	199	13.94	10.1
3	1	175602	24	38+6	YES	YES	300	100	400	100	200	50	50	NO	NO	NO	YES	11.9	9.5	35.5	30.1	71.3	72.5	33.5	31.6	219	22	10.3	9.83
4	1	265892	23	37+6	YES	YES	400	50	450	50	300	50	50	NO	NO	YES	NO	11.6	10	28.2	27.3	74.1	73.8	35.5	36.6	278	289	15.6	17.45
5	1	79261	23	37+5	YES	YES	450	100	550	100	200	200	50	NO	NO	NO	NO	11.8	11.5	34.6	33.2	82.2	82.6	34.1	34.6	229	251	12.46	16.1
6	1	275061	28	27+6	YES	YES	500	70	570	100	300	100	70	NO	NO	YES	NO	8.8	9.3	25.9	27.3	79.2	79.1	34	34.1	107	99	9.84	5.86
7	1	325655	25	40+2	YES	YES	350	100	450	50	300	50	50	NO	NO	NO	NO	11	10.1	32	30.1	90.9	89.6	33.4	33.6	164	189	8.95	8.28
8	1	280755	20	39+6	YES	YES	450	100	550	100	300	100	50	NO	NO	NO	YES	13.9	10.7	38.5	30.4	76.1	77.6	36.1	35.2	303	282	12.56	12.96
9	1	277312	22	37+0	YES	YES	1000	300	1300	100	800	300	100	NO	NO	YES	NO	6	5.7	17.1	16.2	87.7	87.1	35.1	30.6	123	105	8.43	4.7
10	1	286419	25	38+1	YES	YES	400	100	500	50	300	100	50	NO	NO	NO	NO	9.9	8.3	27.9	23.5	79.7	81	35.5	35.3	212	176	6.73	10.41
11	1	300495	25	41+6	YES	YES	100	50	150	50	50	30	20	NO	NO	YES	NO	8.8	7.3	26.8	22.5	61.9	64.5	32.8	32.4	269	275	18.13	16.8
12	1	259812	22	39+3	YES	YES	350	50	400	50	200	100	50	YES	NO	NO	NO	11.3	10.8	34.4	33.5	80.2	84.2	32.8	32.2	234	181	11.87	12.02
13	1	309158	28	38+1	YES	YES	400	50	450	50	300	50	50	YES	NO	YES	YES	7.5	8.4	25.1	28	63.2	66.4	29.9	30	291	194	11.38	12.68
14	1	314980	21	39+0	YES	YES	300	50	350	50	200	50	50	NO	NO	NO	YES	13.1	0	37.7	0	76.6	0	34.7		191		13.06	
15	1	318769	30	39+4	YES	YES	450	50	500	50	300	100	50	NO	NO	YES	YES	12.3	11	34.8	34.2	80.7	80.2	35.3	34.2	285	274	25.25	20.16
16	1	315415	23	37+2	YES	YES	300	50	350	30	200	100	20	NO	NO	NO	NO	11	11.6	31.7	36.3	78.7	84.4	34.7	32	219	243	8.97	13.71
17	1	314980	21	39+0	YES	YES	200	50	250	10	100	100	40	NO	NO	NO	NO	13.1	11.2	37.7	32.1	76.6	78.3	34.7	34.9	191	156	13.06	8.43
18	1	316673	21	38+1	YES	YES	100	50	150	20	80	10	40	NO	NO	NO	YES	12	11	35.8	33.9	80.1	83.3	33.5	32.4	210	217	19.73	12.71
19	1	318695	37	39+4	YES	YES	100	50	150	30	20	50	50	NO	NO	NO	NO	10.6	10.5	32.2	31.4	84.5	85.8	32.9	33.4	311	317	11.13	11.71
20	1	87404	23	41+0	YES	YES	50	50	100	10	50	20	20	NO	NO	NO	NO	12.1	11.9	33.5	37.4	86.8	91.4	36.1	34.5	231	274	9.81	14.27
21	1	318769	20	40+0	YES	YES	200	50	250	20	100	80	50	NO	NO	YES	YES	8.2	8.1	25.9	26	69.4	69.7	31.7	31.2	215	240	16.03	12.92
22	1	349128	24	40+3	YES	YES	200	50	250	50	100	50	50	NO	NO	NO	NO	8.9	7.7	29.4	24.7	68.5	68.9	30.3	21.3	267	227	19.52	10.48
23	1	350012	31	40+3	YES	YES	200	50	250	20	100	100	30	NO	NO	NO	NO	12.8	11.7	38.8	35.3	28.4	28	33	33.1	291	267	14.59	15.12
24	1	380481	19	37+4	YES	YES	250	30	280	30	100	100	50	NO	NO	YES	NO	8.5	8.3	24	24.1	80	82.5	35.4	34.4	56	57	8.19	7.63
25	1	382715	35	37+3	YES	YES	100	50	150	20	50	50	30	NO	NO	NO	YES	10.2	11.1	29.8	33.6	77.2	81	34.2	33	236	219	8.34	10.29
26	1	385201	23	39+4	YES	YES	150	50	200	20	100	50	30	NO	NO	YES	YES	9.7	10.6	31.3	34.7	71.3	73.2	31	30.5	292	412	9.94	14.35
27	1	325451	24	39+4	YES	YES	100	80	180	30	50	50	50	NO	NO	NO	NO	12.3	12.4	35.2	35.9	78.2	79.6	34.9	34.5	236	242	13.5	13.67

MASTERCHART

28	1	384064	24	39+2	YES	YES	240	40	280	20	130	90	40	NO	NO	YES	NO	11.2	8.5	34.4	27	76.1	77.8	32.6	31.5	187	101	13.55	12.84
29	1	24659	27	36+5	YES	YES	40	30	70	10	30	10	20	NO	NO	NO	NO	10.3	10.3	31.4	32	82	83.8	32.8	12.7	218	231	15.04	14.82
30	1	56022	28	35+5	YES	YES	50	10	60	10	20	30	10	NO	NO	NO	NO	13.7	13.5	40.1	40.7	87.9	91.9	34.2	33.2	208	201	13.05	14.21
31	1	54602	24	38+4	YES	YES	100	50	232	20	80	30	20	NO	NO	NO	NO	13.5	12.9	39.2	38.6	75.3	74.2	31.6	30.8	195	188	6.9	4.6
32	1	83101	26	40+5	YES	YES	30	30	60	10	20	20	10	YES	NO	YES	NO	8.7	8.7	30.9	30.4	60	61.5	28.2	28.6	295	288	26.78	17.67
33	1	162422	32	39+1	YES	YES	80	20	100	10	50	30	10	NO	NO	NO	YES	9.2	9	29.2	29.1	81.6	80.4	31.5	30.7	256	260	11.48	10.2
34	1	79221	22	40+1	YES	YES	200	50	250	30	90	80	50	YES	NO	YES	NO	6.7	8.6	23.5	29.5	68.9	72.7	28.5	29.2	235	251	15.72	10.33
35	1	25447	27	39+6	YES	YES	40	20	60	10	20	20	10	YES	NO	NO	NO	12.9	12.9	37.2	37.7	80.2	81.3	34.7	34.2	203	221	8.26	9.18
36	1	59608	23	36+3	YES	YES	380	70	450	60	210	90	90	YES	YES	YES	NO	5.7	7.1	16.4	19.7	78.8	83.1	34.8	36	76	93	10.35	8.25
37	1	86107	34	37+2	YES	YES	60	40	100	30	30	30	10	NO	NO	NO	YES	12.1	10.8	36.6	32	92	90.9	33.1	33.8	196	179	12.33	12.83
38	1	90456	32	39+2	YES	YES	150	30	180	20	70	70	20	NO	NO	NO	YES	14.2	12.2	40.4	34.2	94	93.5	33	35.4	173	130	13.36	13.69
39	1	257243	27	39+0	YES	YES	80	20	100	20	30	30	20	NO	NO	NO	NO	10.8	10.3	34.1	32.1	78	79.1	31.7	31.5	214	220	7.89	7.56
40	1	80861	23	39+1	YES	YES	70	30	100	20	30	20	20	NO	NO	NO	NO	12.5	12	37.6	37.8	82.1	81.1	31.8	31.7	263	252	12	11.78
41	1	97173	20	28+0	YES	YES	80	20	100	20	30	20	30	NO	NO	NO	NO	11	11.2	34.6	35.4	80.4	80.6	31.5	31.6	290	286	22	22.87
42	1	98755	25	33+1	YES	YES	50	30	80	10	30	30	10	NO	NO	NO	NO	9.5	9.8	29.5	30.4	77.6	77.7	32.2	32.2	235	272	10.35	19.89
43	1	84844	28	38+3	YES	YES	100	20	120	20	40	30	30	NO	NO	NO	NO	8.4	7.9	28.8	26.2	70.9	71.2	29.2	30.2	257	231	9.51	12.26
44	1	106318	19	38+4	YES	YES	80	20	100	10	40	30	20	NO	NO	NO	NO	10.8	10.4	32	30.2	86.5	86.3	33.8	34.4	276	265	11.5	11.19
45	1	77667	25	40+3	YES	YES	50	30	80	20	20	20	20	NO	NO	NO	YES	10.4	10.9	32.7	34.5	69.3	72.9	31.8	31.6	230	267	10.8	12.46
46	1	6980	22	36+3	YES	YES	60	30	90	10	30	30	20	NO	NO	NO	YES	9.0	9.3	33.2	34.6	78.5	80.5	33.1	32.7	322	303	15.3	22.57
47	1	103205	35	39+5	YES	YES	40	10	50	10	20	10	10	NO	NO	NO	NO	12.1	12.6	35.6	36.9	92	90	34.5	34.1	180	176	11.1	11.08
48	1	103210	23	38+0	YES	YES	80	20	100	30	30	20	20	NO	NO	NO	NO	9.4	9	28.4	27.2	81.6	82.7	34.2	33.1	240	238	9.1	8.97
49	1	180791	24	38+0	YES	YES	50	30	80	20	20	20	20	NO	NO	NO	YES	12	11.3	35.2	33.7	89.8	91.3	34.1	33.5	221	204	9.01	10.63
50	1	115430	29	37+3	YES	YES	50	30	80	20	20	20	20	YES	NO	NO	NO	11.1	11.3	35.7	35.1	85.8	85.4	31.1	32.2	245	292	8.33	8.44
51	1	116155	23	40+3	YES	YES	280	20	300	20	110	90	80	YES	YES	YES	NO	9.2	6.9	32.7	23.7	65.7	65.3	28.1	29.1	291	234	27.08	13.82
52	1	121851	25	33+0	YES	YES	80	40	120	20	40	40	20	YES	NO	YES	NO	7.5	7.4	23.7	23.6	74.8	75.9	31.6	31.4	100	95	17.71	11.79
53	1	120576	23	34+0	YES	YES	70	30	100	10	30	30	30	YES	NO	NO	NO	13.1	12.4	35.6	36.7	83.5	84.2	32.7	33.8	190	180	11	12.89
54	1	147059	22	25+3	YES	YES	150	50	200	20	50	80	50	NO	NO	YES	NO	3.6	6.9	11.4	20.1	70.8	76.4	31.6	34.3	57	61	18.41	13.08
55	1	2166	20	38+2	YES	YES	50	30	80	20	20	30	10	NO	NO	YES	YES	7.6	9.5	25	30.5	56.2	56.9	30.4	31.1	324	347	24.01	12.73
56	1	124668	22	37+5	YES	YES	50	50	100	10	30	40	20	NO	NO	NO	NO	12.4	11.4	39.3	37.5	81.9	81.9	31.6	30.4	190	194	13.07	11.94
57	1	130613	29	41+6	YES	YES	200	50	250	70	80	50	50	NO	NO	YES	YES	9.4	7.6	28.1	23	80.1	81.9	33.5	33	187	218	18.72	20.35
58	1	130610	26	39+1	YES	YES	50	20	70	10	20	20	20	NO	NO	NO	NO	7.8	7.2	26.9	25	69	71.8	29	28.8	344	325	14.11	15.01
59	1	130551	29	39+2	YES	YES	50	10	60	10	20	20	10	NO	NO	NO	NO	11.1	11.2	32.9	32.6	87	79.9	33.7	34.4	157	158	8.15	13.73
60	1	130607	19	40+1	YES	YES	150	50	200	20	80	60	40	YES	NO	YES	YES	8.2	7.4	24.9	23.3	77.1	77.2	32.9	31.8	145	174	30.69	26.1
61	1	133804	20	30+1	YES	YES	180	80	260	30	120	80	30	NO	NO	NO	YES	11.6	10	35.5	30.1	82	81.8	32.7	33.2	203	196	13.08	13.43
62	1	319553	25	39+0	YES	YES	50	10	60	10	20	20	10	NO	NO	NO	NO	10.7	11	31.6	32.7	95.2	97.9	33.9	33.6	107	101	12.65	11.05
63	1	155084	22	39+5	YES	YES	180	30	210	20	130	30	30	NO	NO	NO	NO	12.5	9.5	36.5	28.5	84.9	87.7	34.2	33.3	267	244	18.41	11.72
64	1	160337	29	34+5	YES	YES	200	20	220	40	80	50	50	NO	NO	YES	NO	10.4	9.7	30.6	30.2	84.2	85.5	36	34	181	151	15.21	13.85
65	1	162652	32	40+2	YES	YES	260	20	280	20	140	100	20	NO	NO	YES	NO	11.8	8.6	35.2	26.6	88.2	93	33.5	32.3	262	227	15.8	15.9
66	1	163957	24	35+5	YES	YES	50	30	80	10	30	30	10	NO	NO	NO	NO	8.7	9.1	25.7	26.8	84.5	85.6	33.9	34	189	187	18.79	17.19
67	1	165503	19	39+6	YES	YES	50	10	60	10	20	20	10	NO	NO	NO	NO	8.9	8.8	29.7	29.8	65.1	60.6	30.1	29.5	480	476	17.25	18.22
68	1	174321	19	40+2	YES	YES	70	10	80	10	30	30	30	NO	NO	NO	NO	9.9	9.6	37.8	32.7	84.7	86.2	33.7	32.1	217	220	14.18	11.12
69	1	175253	26	38+6	YES	YES	60	10	70	0	30	30	10	NO	NO	NO	NO	9.4	9.2	35.7	31.7	90.4	95.5	34.7	33.4	221	178	21.81	14.65
70	1	173762	20	39+4	YES	YES	50	50	100	10	40	40	10	NO	NO	NO	NO	9.7	8.9	34.6	32.1	86.3	86.7	34.1	34.9	233	228	17.96	24.56
71	1	245937	30	27+4	YES	YES	430	60	490	30	260	120	80	NO	YES	YES	YES	7.8	9	24.1	28	93.4	89.7	32.4	32.1	148	225	14.16	10.02
72	1	247396	24	38+0	YES	YES	60	10	70	10	30	20	10	NO	NO	NO	NO	11.7	11.4	36.3	36.4	80.1	81.1	32.2	31.3	170	334	17.22	12.17
73	1	249093	26	39+6	YES	YES	220	60	280	40	130	60	50	YES	NO	NO	YES	10.5	9.3	32.6	30.4	76.5	78.6	32.2	30.6	276	292	14.33	13.07

74	1	249090	20	39+6	YES	YES	40	20	60	0	20	20	20	YES	NO	NO	YES	9.9	9.7	31.6	31.5	66.2	65.6	14.6	14.6	329	328	15.17	13.1
75	1	253590	25	39+0	YES	YES	110	30	140	20	50	40	30	NO	NO	NO	NO	11.6	11.2	35.6	34.7	82.2	83.4	32.6	32.3	229	205	13.5	16.47
76	1	232620	32	36+6	YES	YES	140	40	180	30	80	40	30	NO	NO	NO	NO	13.1	11.1	37.3	38.7	83.4	85.2	35.1	33.9	85	127	14.1	15.46
77	1	255101	35	38+5	YES	YES	80	40	120	20	60	20	20	NO	NO	NO	NO	9.8	9.5	31	31.6	78.9	81.2	31.7	31.5	215	219	9.86	13
78	1	249086	25	35+4	YES	YES	80	60	140	10	70	40	20	YES	NO	NO	YES	13.4	11.7	39.2	34.9	84.8	86.6	34.2	33.5	268	238	13.63	13.62
79	1	228885	35	39+3	YES	YES	260	40	300	20	180	90	10	NO	NO	YES	NO	16.7	14.6	49.1	43.3	91.4	91.9	34	33.7	228	231	14.68	19.96
80	1	199698	31	40+1	YES	YES	160	50	210	10	110	70	20	YES	NO	YES	YES	8.4	9.4	27.3	29.6	85	82.9	30.8	31.8	259	231	10.33	11.19
81	1	226404	23	38+0	YES	YES	70	30	100	20	30	30	20	NO	NO	NO	NO	9.1	8.9	27.3	26.4	79.6	79	33.3	33.1	295	271	11.13	18.62
82	1	259305	28	39+1	YES	YES	120	20	140	10	50	40	40	NO	NO	NO	NO	11.7	11.5	34.7	35.2	92	91.1	33.7	33.5	134	176	12.45	12.42
83	1	261977	30	39+5	YES	YES	90	20	110	20	30	30	30	YES	NO	NO	YES	12.1	10.8	36.2	32.9	86.2	86.8	32.9	32.8	247	245	10.73	10.25
84	1	281995	24	38+4	YES	YES	60	10	70	10	20	20	20	YES	NO	YES	NO	9.6	9	37.4	36.2	85.8	87	33.7	33.1	225	214	10.31	9.06
85	1	282163	31	37+1	YES	YES	180	10	190	10	90	70	20	NO	NO	NO	NO	11.8	10.2	34.7	31.4	87	90	34	32.5	63	165	5.21	17.52
86	1	288848	22	38+2	YES	YES	50	20	70	10	20	20	20	NO	NO	NO	NO	9.7	9.2	33.1	25.9	88	87.8	33.8	34.7	209	199	10.93	9.38
87	1	27008	20	38+4	YES	YES	60	10	70	10	30	20	10	YES	NO	NO	NO	9.6	9.5	34.6	35.1	86.2	85.7	32.1	31.2	377	299	11.4	12
88	1	26973	32	39+5	YES	YES	80	10	90	10	30	30	20	NO	NO	NO	NO	12	11.8	38.5	38.4	77.7	77.9	31.1	31.6	209	222	6.9	8.2
89	1	26713	29	38+5	YES	YES	60	10	70	10	30	20	10	YES	NO	NO	NO	10.5	10.1	32.4	32.2	81.9	81.4	32.4	32.6	284	286	9	8.6
90	1	26618	22	40+1	YES	YES	90	10	100	20	30	30	20	YES	NO	NO	NO	12.6	12.4	40.3	40	90.4	91.2	31.2	31.6	167	174	7.6	7.2
91	1	230180	21	41+2	YES	YES	30	30	60	10	30	20	10	NO	NO	NO	YES	9.7	9	29.8	27.1	67.2	67.3	31.6	30.8	275	270	14.3	9.26
92	1	227026	25	37+5	YES	YES	70	20	90	10	30	30	20	NO	NO	NO	NO	12.4	12.1	37.1	36.9	95.6	96.4	33.4	31.8	321	348	6.54	11.21
93	1	236101	24	39+1	YES	YES	40	20	60	10	20	20	10	YES	NO	NO	YES	10.4	10.2	31	31.7	79.1	81.5	33.5	32.2	202	251	8.24	15.04
94	1	221981	24	38+4	YES	YES	30	20	50	10	20	10	10	NO	NO	NO	NO	11	10.6	33.6	34.1	82.3	80.2	32.7	31.9	223	236	10.9	12.33
95	1	231909	23	39+1	YES	YES	80	30	110	20	40	30	20	YES	NO	NO	NO	12.7	11.6	37.3	36.7	94.2	95.1	34.5	33.2	221	207	10.6	11.18
96	1	231982	32	37+4	YES	YES	570	100	670	40	280	250	100	NO	YES	YES	NO	5.1	3.4	20.2	17.87	74.6	73.89	27.8	24.2	113	98	11.89	10.16
97	1	230192	20	40+6	YES	YES	60	10	70	10	30	20	10	NO	NO	YES	YES	9	8.7	30.2	29.8	84	84.5	29.8	28.6	431	420	21.6	22.7
98	1	239002	32	37+4	YES	YES	70	20	90	10	40	20	20	NO	NO	NO	NO	11.5	11.1	35.9	34.5	63.5	65.2	32	33.4	275	281	8.06	7.92
99	1	186120	26	37+4	YES	YES	40	20	60	10	20	20	10	NO	NO	NO	NO	10.3	10.1	32.9	32.5	61.8	61.1	31.3	30.4	406	369	625	549
100	1	261888	22	39+6	YES	YES	70	40	110	10	40	30	30		NO	NO	NO	9.2	9.1	29.3	28.9	84.4	83.7	31.4	31.3	226	219	11.21	12.12
101	1	223099	27	36+6	YES	YES	60	50	110	10	40	40	20	NO	NO	NO	YES	11.3	10.8	35.5	34.7	80.7	80.2	31.8	30.1	255	230	13.17	12.97
102	1	221986	30	37+0	YES	YES	260	50	310	20	170	90	30	NO	YES	YES	NO	11.7	9.1	29.2	24.6	80.7	75.4	34.7	30.8	175	186	8.91	9.11
103	1	257987	20	37+2	YES	YES	70	40	110	10	40	30	30	YES	NO	NO	YES	11.1	10.6	33.7	32.4	76	74.2	31.9	30.2	319	326	13.08	12.14
104	1	267948	26	39+1	YES	YES	260	70	330	40	140	90	60	NO	YES	YES	NO	12.4	9.8	35.9	33.2	88.9	87.1	36.7	35.9	190	176	14.21	12.68
105	1	226787	28	38+3	YES	YES	40	10	50	10	20	10	10	NO	NO	NO	NO	11	10.7	32.4	32.7	86.2	87	34	32.7	172	199	9.07	8.05
106	1	237687	32	37+5	YES	YES	40	30	70	10	30	20	10	YES	NO	NO	YES	11.5	11.2	35.1	34.9	84.5	83.6	35.7	34.9	222	192	9.31	7.49
107	1	232715	36	38+5	YES	YES	50	20	70	10	20	20	20	NO	NO	NO	NO	12.7	12.5	38.1	37.6	91.4	92.1	33.3	34	132	164	12.98	11.2
108	1	237780	22	37+5	YES	YES	30	20	50	10	20	10	10	YES	NO	NO	NO	9.9	9.7	31.2	30.8	67.7	67.9	32.1	33.4	313	324	11.12	12.46
109	1	235824	26	39+2	YES	YES	210	50	260	20	90	90	60	YES	YES	YES	NO	6.9	7.1	27.8	26.2	78.6	79.4	27.9	27.3	161	187	11.92	13.1
110	1	235124	24	38+6	YES	YES	120	60	180	20	80	60	20	YES	NO	NO	YES	11.6	11.1	35.1	34.4	88.7	87.1	33.7	34.9	298	301	12.63	11.61
111	1	238197	23	37+6	YES	YES	290	80	370	30	190	170	80	YES	YES	YES	YES	9.7	7.3	30.1	27.4	67.6	63.2	32.2	30.9	275	286	14.39	12.03
112	1	232681	35	39+6	YES	YES	90	50	140	10	70	50	10	YES	NO	NO	NO	12.9	11	34	32.3	81.7	86.8	31	29.6	231	213	14.2	15.68
113	1	901	19	37+3	YES	YES	280	100	380	20	180	120	60	YES	YES	YES	NO	10.6	8.2	30.6	28.4	86.2	81.9	34.5	32.6	336	291	10.9	9.5

1	2	398113	30	36+4	YES	YES	500	50	550	50	400	80	20	NO	NO	YES	NO	10.4	7.7	29.5	22.7	93.4	95	35.3	33.9	221	296	20.56	7.28
2	2	181957	24	36+4	YES	YES	600	100	700	100	400	120	80	NO	NO	NO	NO	12.4	9.7	35.2	27.2	83.2	83.2	35.2	35.7	191	151	15.9	16.49
3	2	175602	28	36+3	YES	YES	300	100	400	50	200	100	50	NO	NO	YES	NO	7.8	8.6	24.5	26.5	63.5	66.9	31.8	32.5	325	326	12.54	13.74
4	2	265892	20	40+0	YES	YES	250	100	350	100	150	50	50	NO	NO	NO	NO	9.3	7.6	26.8	22.8	75.3	76.8	34.7	33.3	289	269	10.87	11.02
5	2	79261	31	30+6	NO	YES	400	100	500	100	200	150	50	NO	NO	YES	NO	12.2	11.8	35.3	35.3	78.4	81.5	34.6	33.4	240	239	10.38	11.02
6	2	275061	26	38+2	YES	YES	400	50	450	100	150	100	100	NO	NO	YES	NO	10.9	7.4	33.1	22.6	80.1	81.9	26.9	32.7	180	154	10.07	11.01
7	2	325655	28	37+3	YES	YES	400	100	500	50	200	200	50	NO	NO	NO	NO	12.9	12.6	37.3	37	83.8	85.5	29	29.1	223	220	11.96	11.03
8	2	280755	28	37+2	YES	YES	400	100	500	100	200	100	100	NO	NO	YES	NO	3.9	8.2	11.3	23.5	81.9	82.5	34.5	34.9	36	108	8.14	7.86
9	2	277312	22	40+5	YES	YES	350	120	470	50	200	150	70	NO	NO	NO	NO	9.6	9	28.5	27.5	81	83.1	33.7	32.7	228	258	17.29	16.59
10	2	286419	33	39+0	YES	YES	300	100	450	50	200	50	50	NO	NO	NO	NO	9.9	9.3	28.6	26.6	94.7	96	34.6	35	222	204	14.8	10.69
11	2	300495	21	37+5	YES	YES	350	50	400	50	200	50	100	NO	NO	NO	NO	9.4	10.8	30.8	31.2	68	68.8	30.5	30.5	247	281	11.68	11.67
12	2	259812	30	37+2	YES	YES	400	250	650	50	400	150	50	NO	NO	NO	NO	10.8	10.2	32.5	31.6	77.8	76.8	33.2	33.5	271	251	15.58	15.12
13	2	309158	28	37+6	YES	YES	300	200	500	50	300	50	100	NO	NO	NO	NO	11.6	10.8	33.2	32.4	83.4	82.1	34.9	36.9	150	156	9.23	9.2
14	2	314980	28	40+1	YES	YES	400	100	500	50	250	150	50	NO	NO	NO	NO	8.2	8.1	25.9	26	69.4	69.7	31.7	31.2	215	240	16.03	12.92
15	2	318769	22	40+1	YES	YES	450	150	600	100	400	50	50	NO	NO	YES	NO	10.4	8.4	31.3	24.8	79.4	79.3	33.2	34.3	231	170	12.56	15.47
16	2	315415	24	38+4	YES	YES	400	250	650	50	350	100	50	NO	NO	YES	NO	10.7	10.7	32.4	32.8	85.5	87.2	33	32.6	167	258	10.33	15.78
17	2	314980	20	38+4	YES	YES	500	200	700	100	450	100	50	NO	NO	YES	NO	13.1	8.4	38.4	24.9	84.2	84.1	34.1	33.7	68	97	15.12	24.7
18	2	316673	30	37+3	YES	YES	400	270	670	50	450	100	70	NO	NO	NO	NO	12.6	8.5	37.8	25.4	75.9	75.4	33.3	33.5	327	249	7.72	7.24
19	2	318695	25	37+0	YES	YES	350	100	450	50	200	100	100	NO	NO	NO	NO	11.5	11.4	32.3	31.2	82.7	81.9	34.3	34.5	111	130	9.83	8.1
20	2	87404	29	38+5	YES	YES	400	100	500	50	250	100	100	NO	NO	NO	NO	11.1	9.4	31.2	33.4	77	77.9	31.5	30.9	326	279	15.28	12.35
21	2	318769	24	38+6	YES	YES	500	100	600	50	300	200	50	NO	NO	NO	NO	8.8	7.1	33.2	32.4	76.3	80.5	33.7	32.4	31	25	3.65	3.16
22	2	349128	23	27+4	YES	YES	450	400	550	50	350	100	50	NO	NO	NO	NO	13.9	11.8	36.7	33.5	82.3	86	32	35	96	99	15.23	12.13
23	2	350012	25	33+3	YES	YES	450	100	550	50	300	100	50	NO	NO	NO	NO	12.3	10.7	35.3	30.6	79.8	79.7	34.9	35	189	153	1.6	12.66
24	2	380481	28	26+4	YES	YES	200	100	300	50	100	100	50	NO	NO	NO	NO	13.1	11.5	40.5	34.1	89.2	86.3	32.3	33.7	289	252	22.47	18.5
25	2	382715	23	36+0	YES	YES	450	50	500	50	200	150	100	NO	NO	YES	NO	8.7	7.8	27	24.1	68.7	71.1	32.2	32.4	281	268	8.27	10.58
26	2	385201	28	41+2	YES	YES	80	30	110	20	30	30	30	NO	NO	NO	NO	12.3	12.1	35.4	36.1	88.7	94.5	34.7	33.2	180	163	11.69	16.47
27	2	325451	28	39+2	YES	YES	220	110	330	10	210	60	50	NO	NO	YES	NO	10.8	7.8	31.4	31.1	83.1	85	34.4	34.1	235	235	18.45	18.89
28	2	384064	26	32+2	YES	YES	350	100	450	50	170	140	90	NO	YES	YES	NO	6.8	8	20.4	24.6	70.6	73.9	33.3	32.5	150	172	11.64	9.42
29	2	24659	25	39+4	YES	YES	300	30	330	50	140	80	60	NO	YES	YES	NO	9.4	7.6	30.2	23.6	68.6	68.4	31.1	32.2	283	267	13.65	25.86
30	2	56022	25	38+4	YES	YES	200	100	300	70	80	80	70	NO	NO	NO	NO	9.9	8.9	30.6	27	24.4	25.8	32.4	33	268	329	17.18	22.32
31	2	54602	20	37+1	YES	YES	190	30	220	20	90	80	30	NO	NO	YES	NO	8.6	8	25.7	23.4	85.1	86	33.5	32.6	238	228	17.7	16.12
32	2	83101	23	38+0	YES	YES	70	20	90	20	30	20	20	NO	NO	NO	NO	12.6	11	37.9	37	75.5	77.4	33.2	25.1	276	232	13.54	10.5
33	2	162422	27	40+1	YES	YES	80	30	110	10	40	30	30	NO	NO	NO	NO	12.3	11.7	34.2	33.3	77.9	78.7	36	35.1	202	224	11.7	9.09
34	2	79221	34	40+1	YES	YES	200	50	250	20	150	50	30	NO	NO	YES	NO	9.4	8.8	28.8	27.9	73.5	75.6	32.6	31.5	281	297	10.09	10.46
35	2	25447	22	37+3	YES	YES	130	30	160	20	70	40	30	NO	NO	NO	NO	12.6	11.4	35.5	32.9	82.8	83.9	35.5	34.7	150	179	10.31	12.03
36	2	59608	20	39+2	YES	YES	280	40	320	30	160	90	40	NO	NO	NO	NO	10.6	8.9	32.9	28	76.7	80	32.2	25.4	287	326	18.9	24.58
37	2	86107	22	37+5	YES	YES	580	50	630	20	300	180	130	NO	YES	YES	NO	9.5	6.1	28.3	18.2	72.4	81.3	33.6	33.5	170	199	5.99	3.26
38	2	90456	28	40+0	YES	YES	140	110	250	40	90	100	20	NO	NO	NO	NO	12.2	11.4	33.4	32.8	76.4	80.6	33.6	34.8	355	305	10.12	8.88
39	2	257243	24	40+0	YES	YES	130	90	220	30	110	70	10	NO	NO	NO	NO	13	10.5	39.2	31.8	76.4	78.3	33.2	33	192	198	18.59	14.6
40	2	80861	28	28+2	YES	YES	450	30	480	30	240	160	50	NO	YES	YES	NO	5	6.7	18	21.2	63.4	66.3	27.8	31.6	266	201	12.6	23.47
41	2	97173	23	34+4	YES	YES	170	50	220	30	90	60	40	NO	NO	YES	NO	7.5	6.9	25.1	23.1	65.4	72.2	29.9	29.9	159	166	11.73	8.85
42	2	98755	19	39+0	YES	YES	280	50	330	10	180	100	40	NO	NO	YES	NO	8.5	8	24.7	23.6	84.3	85.5	34.4	33.9	165	191	7.76	7.24
43	2	84844	22	37+5	YES	YES	250	50	300	20	160	80	40	NO	NO	NO	NO	11.9	10.8	36.6	34.5	79.6	81.6	32.5	31.3	297	259	18.15	13.3
44	2	106318	25	39+4	YES	YES	80	50	130	10	80	20	20	NO	NO	YES	NO	12.6	11.6	36.8	34.7	84	86.8	34.2	33.4	160	170	10.97	8.78
45	2	77667	21	38+5	YES	YES	420	60	480	90	230	80	80	NO	YES	YES	NO	6.2	7.4	18.7	21.2	85.8	87.6	33.2	34.9	124	235	26.48	26.2
46	2	6980	25	39+2	YES	YES	80	40	120	20	40	30	30	NO	NO	NO	NO	9.9	9.8	32.2	32.2	81.5	83	31.1	30.7	150	166	9.31	10.21

47	2	103208	26	39+6	YES	YES	80	40	120	20	60	30	20	NO	NO	NO	NO	9.6	9.4	32	31.6	78	79.2	33.1	32.9	317	320	19.38	16.01
48	2	103210	19	38+3	YES	YES	350	50	400	20	170	150	80	NO	YES	YES	NO	9.5	7.4	28.3	23.1	89.8	93.9	33.6	32	224	191	8.58	9.1
49	2	180791	25	36+6	YES	YES	480	70	550	50	260	140	100	NO	YES	YES	NO	6.9	8.3	23.2	25.2	72.7	82.6	29.7	32.9	128	207	22.67	11.38
50	2	115430	27	38+4	YES	YES	300	50	350	20	200	80	50	NO	NO	NO	NO	12.6	10.8	37.6	32.3	89.7	94.2	33.5	30.9	96	81	17.77	9.79
51	2	116155	30	37+2	YES	YES	100	40	140	10	80	30	20	NO	NO	NO	NO	12.9	13.3	37.6	40.6	88.3	94.2	34.3	32.8	276	339	16.19	15.01
52	2	121851	22	32+0	YES	YES	100	50	150	30	60	20	20	NO	NO	NO	NO	9.7	9.5	31.6	32	84.6	83.7	34.2	33.6	219	226	12.1	11.9
53	2	120576	19	36+6	YES	YES	100	50	150	20	70	30	30	NO	NO	NO	NO	9.1	9.8	25.6	36.2	89.2	88.1	31.6	30.7	193	236	9.87	10.02
54	2	147089	19	31+6	YES	YES	360	20	380	30	120	140	90	NO	YES	YES	NO	9.2	7.5	30.1	23.8	68.7	70.8	30.6	31.5	185	164	15.61	19.65
55	2	2166	30	39+5	YES	YES	220	80	300	20	120	80	80	NO	NO	NO	NO	11.6	9.3	35.4	29.9	83.6	87.2	32.6	31.1	280	222	11.98	8.97
56	2	124668	34	38+4	YES	YES	290	140	430	30	220	110	70	NO	YES	YES	NO	11.6	8.8	33.9	24.2	83.5	80.9	34.2	36.4	302	263	10.3	16.99
57	2	130613	32	33+5	YES	YES	280	50	330	20	180	80	50	NO	NO	YES	NO	6.4	8.2	27.2	26.1	80.7	83.1	32.6	36.2	219	224	10.11	9.08
58	2	130610	22	26+4	YES	YES	360	50	410	30	170	130	80	NO	YES	YES	NO	9.9	9.2	30.2	27.2	73.5	72.7	32.8	33.8	112	81	33.95	43.56
59	2	130551	18	38+6	YES	YES	200	40	240	30	100	80	30	NO	NO	NO	NO	10.1	9.5	30.5	29.3	83.6	85.4	33.1	32.4	295	346	9.09	15.41
60	2	130607	28	40+1	YES	YES	180	60	240	10	100	80	50	NO	NO	NO	YES	NO	9.7	6.4	26.2	25	110.2	115.2	34.5	33.6	310	290	11.72	14.52
61	2	133634	21	39+3	YES	YES	400	40	440	40	210	110	80	NO	YES	YES	NO	9.1	6.5	29.9	23.7	65.3	71	30.4	27.4	200	170	13.42	13.56
62	2	319553	25	39+5	YES	YES	250	30	280	20	110	90	60	NO	NO	YES	NO	8.6	9.6	28.2	34	70	71.9	30.5	28.2	297	272	8.73	10.5
63	2	155064	26	40+4	YES	YES	160	60	220	20	150	30	20	NO	NO	NO	NO	9.6	8.3	36.2	34.1	74.5	78.4	34.8	33.1	212	204	12.5	10.09
64	2	160337	22	25+4	YES	YES	250	20	270	20	160	50	40	NO	NO	YES	NO	9.9	9.6	27.1	26.6	94.1	93.5	36.5	37.2	231	242	13.68	11.26
65	2	162652	25	39+4	YES	YES	550	20	570	100	200	180	90	NO	YES	YES	NO	9.4	5.1	24.2	19.4	69.1	63.6	30.6	26.2	244	219	15.65	11.21
66	2	163957	36	33+5	YES	YES	210	30	240	40	80	60	60	NO	NO	YES	NO	11	9.9	34.1	31.2	77.5	80.8	32.3	31.7	194	216	13.5	9.61
67	2	165503	25	39+0	YES	YES	230	60	290	20	140	90	40	NO	NO	YES	NO	8.9	7.6	27.3	24.4	86.9	89.7	32.6	31.1	142	129	15.37	18.26
68	2	174321	36	38+4	YES	YES	80	50	130	20	40	40	30	NO	NO	NO	NO	10	9	32.9	31	76	79.5	30.4	29	240	250	7.8	6.52
69	2	175253	19	37+4	YES	YES	180	40	220	20	100	80	20	NO	NO	YES	NO	12.4	10.9	34.7	30.8	92.3	93.9	35.7	35.4	19	39	12.66	11.35
70	2	173762	32	36+3	YES	YES	150	40	190	20	100	50	20	NO	NO	NO	NO	9.7	11.7	31.8	38.2	79.5	80.1	30.5	30.6	328	314	9.37	15.29
71	2	248537	31	38+4	YES	YES	320	70	390	40	180	120	50	NO	YES	YES	NO	11.3	9.9	35.4	30.4	76	74.3	31.9	32.6	253	215	9.07	15.02
72	2	247386	27	40+3	YES	YES	80	50	130	20	50	30	30	NO	NO	NO	NO	12.8	12.1	37.6	36.2	83.6	84.2	33.9	30.4	144	160	8	8.12
73	2	248093	26	37+3	YES	YES	330	80	410	40	200	80	90	NO	YES	YES	NO	9.5	10.3	29.2	31.7	75.8	77.3	32.5	32.5	212	221	8.08	11.07
74	2	249090	32	41+0	YES	YES	520	70	590	80	260	120	130	NO	YES	YES	NO	6.6	7.5	19.5	20.7	93.6	90	33.8	36.2	173	150	9.09	6.75
75	2	253560	32	39+5	YES	YES	80	30	110	20	30	30	30	NO	NO	NO	NO	9.7	10.4	29.4	32.3	87.6	89.2	33	32.2	302	324	9.17	11.29
76	2	232620	30	39+1	YES	YES	210	30	240	30	100	70	40	NO	NO	YES	NO	8.5	8.1	26	25.7	78.1	79.3	32.7	31.5	121	171	13.35	11.78
77	2	255101	21	38+4	YES	YES	170	70	240	50	90	50	50	NO	NO	NO	NO	9.5	8.4	28.5	26.4	77.2	78.3	33.3	31.8	212	188	12.08	8.3
78	2	249086	29	39+2	YES	YES	60	20	80	20	20	20	20	NO	NO	NO	NO	10.1	10.3	33.2	32.8	76.3	79	30.2	31.4	272	263	9.01	9.03
79	2	228885	19	34+2	YES	YES	70	40	110	30	40	20	20	NO	NO	NO	NO	10.7	10.4	32.5	31.9	77.6	76.4	32.8	32.7	214	210	15.91	16.12
80	2	198688	22	38+1	YES	YES	330	50	380	30	210	90	90	NO	YES	YES	NO	7.2	10.8	21.4	29.8	81.4	79.8	33.6	35.2	160	229	8.77	9.04
81	2	226404	22	38+1	YES	YES	120	40	160	30	70	30	30	NO	NO	NO	NO	9.6	9.4	33.4	33.1	32.7	33.1	31.7	31.8	205	210	12.7	10.21
82	2	259305	21	37+2	YES	YES	180	20	200	10	120	50	20	NO	NO	YES	NO	8.2	7.7	22.3	21.8	112.1	110.6	36.8	33.1	340	329	9.83	11.6
83	2	261977	36	38+3	YES	YES	50	20	70	10	30	20	10	NO	NO	NO	NO	11	11.4	32	34.8	85.6	87	34.4	32.8	288	301	10.33	16.57
84	2	281995	31	37+6	YES	YES	70	10	80	20	20	20	20	NO	NO	NO	NO	8.9	9	30.8	31.8	66.4	67.7	29.1	28.3	200	428	11.67	17.42
85	2	282183	26	38+4	YES	YES	80	10	90	10	30	30	20	NO	NO	NO	NO	10.1	9.9	31.2	30.8	76.5	78.8	32.4	32.1	187	160	8.01	10.54
86	2	288848	22	38+0	YES	YES	140	20	160	30	70	30	30	NO	NO	NO	NO	11.1	10.6	32.2	31.9	88.2	87.4	34.1	33.2	226	201	8.9	11.76
87	2	27008	21	40+3	YES	YES	190	50	240	40	80	60	60	NO	NO	NO	NO	10.3	8.4	30.9	25.8	84.2	84.3	32.3	32.8	197	170	12.62	11.7
88	2	26973	24	38+4	YES	YES	40	30	70	10	30	20	10	NO	NO	NO	NO	10.2	10.1	32.1	33.1	79.7	80.9	31.8	30.5	222	209	9.68	11.99
89	2	26713	23	37+3	YES	YES	310	40	350	60	110	90	90	NO	NO	NO	NO	8.4	10.9	26.8	33.7	63.4	63.1	31.3	32.3	308	270	10.37	10.8
90	2	26618	32	40+1	YES	YES	70	30	100	10	30	30	30	NO	NO	NO	NO	9.4	8.8	30.8	27.8	73.4	74.7	30.5	31.6	287	171	11.2	6.4

91	2	230180	21	39+1	YES	YES	110	50	160	20	70	50	20	NO	NO	NO	NO	9.5	9	35.1	35.3	83.8	82.9	32.7	31.9	366	349	20	11.9
92	2	227026	19	35+0	YES	YES	310	30	340	20	180	110	30	NO	NO	YES	NO	9.9	7.4	30.4	22.6	81.5	81.5	32.5	32.7	320	280	10.9	14.7
93	2	236101	21	38+4	YES	YES	100	20	120	10	60	40	10	NO	NO	YES	NO	8.9	8.3	26.8	25	87.8	87.7	33.2	33.2	205	158	13.7	10.7
94	2	221981	34	40+5	YES	YES	340	50	390	20	180	120	70	NO	YES	YES	NO	9.4	7.2	30.2	26.9	72.5	68.4	31.1	27.8	293	276	12.6	13.91
95	2	231909	25	36+6	YES	YES	370	40	410	10	230	140	31	NO	YES	YES	NO	11.6	7.9	39.8	31.7	88.2	83.2	34.6	29.8	266	231	9.21	11.23
96	2	231982	24	39+4	YES	YES	120	70	190	20	80	60	30	NO	NO	NO	NO	11.8	11.4	38	36.9	72.1	73.7	31.1	34.2	404	348	10.55	14.06
97	2	230192	24	36+2	YES	YES	370	60	430					NO	YES	YES	NO	11.2	7.6	33.3	26.3	77.1	74.5	33.6	36.1	166	140	20.9	12.71
98	2	239002	23	37+2	YES	YES	90	30	120	10	90	30	30	NO	NO	NO	NO	9.3	8.7	25.1	23.3	82.8	84.9	37.1	36.8	219	244	23.37	11.82
99	2	186120	20	38+2	YES	YES	290	70	360	20	180	130	30	NO	YES	YES	NO	8.3	6.9	24.8	21.3	106.4	99.7	33.5	30.7	111	124	7.37	8.92
100	2	261888	25	37+1	YES	YES	210	60	270	20	130	70	50	NO	NO	YES	NO	8.6	7.7	27.1	25.9	70	68.3	31.7	32.8	258	264	11.2	13.71
101	2	223099	24	39+4	YES	YES	220	30	250	30	90	80	50	NO	NO	YES	NO	9.8	7.9	28.2	26.8	91.6	88.7	34.8	31.4	358	326	13.34	11.1
102	2	221986	20	38+2	YES	YES	260	50	310	30	150	80	50	NO	NO	NO	NO	12.9	10.3	36.4	32.7	93.7	91.5	38.9	39.25	414	403	9.68	10.11
103	2	257987	24	38+2	YES	YES	260	60	320	40	140	80	60	NO	NO	YES	NO	9.3	7.8	29.9	24.6	87.2	85.9	31.1	29.6	222	219	8.97	10.27
104	2	267948	27	37+3	YES	YES	230	60	290	30	120	90	50	NO	NO	NO	NO	12.7	10.2	32.5	30.6	86.1	85.7	32.5	31.2	178	180	12.1	11.12
105	2	226787	33	38+5	YES	YES	130	40	170	20	70	50	30	NO	NO	NO	NO	10.6	9.6	33.6	30	84.4	80.9	31.5	32	182	180	8.27	8.5
106	2	237687	23	39+4	YES	YES	310	100	410	20	180	140	70	NO	YES	YES	NO	11.9	8.8	38.1	31.7	91.4	87.6	33.3	29.5	194	188	12.98	13.23
107	2	232715	25	37+2	YES	YES	310	60	370	10	180	110	70	NO	YES	YES	NO	10.7	8.4	32.6	29.3	85.6	86.4	32.8	32.9	219	234	11.21	10.16
108	2	237780	24	41+2	YES	YES	110	30	140	20	60	40	20	NO	NO	YES	NO	9.9	9	30.1	28.3	68.6	67.9	32.4	31.8	259	270	10.33	9.26
109	2	235824	22	40+1	YES	YES	110	30	140	20	60	30	30	NO	NO	NO	NO	12.7	12.4	35.9	36.1	90.1	90.9	34.6	34.3	353	311	11.91	14.4
110	2	235124	23	41+2	YES	YES	360	70	430	20	230	120	60	NO	YES	YES	NO	6.8	5.4	28.2	24.7	79.1	76.8	28.6	29.2	156	140	13.12	14.16
111	2	238197	32	37+2	YES	YES	320	110	430	30	180	170	50	NO	YES	NO	NO	11	7.9	32.1	29.6	69.5	66.8	34.1	32.9	311	287	14.39	13.86
112	2	232681	24	39+1	YES	YES	340	70	410	20	230	140	20	NO	YES	NO	NO	10.2	7.5	30.1	23.2	82.6	79.7	35.4	32.2	280	213	1.19.13.86	
113	2	901	26	38+1	YES	YES	210	20	230	30	80	70	50	NO	NO	NO	NO	11.8	11.1	32.5	33.6	80.2	81.2	33.6	29.6	289	275	11.6	12.6

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