ASSESSMENT OF RISK FOR CESAREAN DELIVERY FOLLOWING LABOR INDUCTION USING A VALIDATED CALCULATOR- A ONE YEAR OBSERVATIONAL STUDY.

By

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ABBREVATIONS

WHO	–	World Health Organization.
CDC	–	Centre of Disease Control.
B.C.	–	Before christ.
PPH	–	Post partum hemorrhage.
BMI	–	Body mass Index.
phIGFBP-1	–	Cervical phosphorylated Insulin like growth factor binding protein – 1.
NFHS	–	National Family Health Survey.
ACOG	-	American College of Obstetricians and Gynecologist.
SMFM	-	Society for Maternal-Fetal Medicine.
ARRIVE	–	A Randomixed Trial of Induction versus Expectant Management.
PENN	–	University of Pennyslvenia.
FGR	–	Fetal growth restriction.
GDM	–	Gestational Diabetes Mellitus.
PROM	–	Premature rupture of membranes.
PGE1	-	Misprostol.
PGE2	–	Dinoprostone.
TVS	–	Transvaginal Sonography.
WHOMCS	-	WHO Multi-country Survey.
WHOGS	-	WHO Global Survey.
NICHD	–	National Institute of Child Health and Development.
VBAC	–	Vaginal birth after cesarean.
AUC	–	Area under curve.

ABSTRACT

Assessment of Risk For Cesarean Delivery Following Labor Induction Using A Validated Calculator.

Introduction:

Induction is a common obstetrical procedure, involving nearly 20% of all deliveries, and the rates are increasing. The efficiency of labor induction on cesarean delivery rates is controversial because it relies upon the balancing group. Though various risk elements are associated with failure of induction, these are solely are not sufficient enough to estimate, the actual chance of cesarean and it is clinically important to be able to precisely predict the chance of cesarean section following an induction of labor.

Objective:

To assess the possibility of cesarean delivery and also the predictive accuracy following induction of labor by utilizing a validated web based calculator – THE PENN SCORE.

Materials and Methodology

A prospective observational study on women admitted in the labour room and planned for induction of labour in KAHER'S Dr. Prabhakar Kore Charitable Hospital, Belagavi, from January 2020 – February 2021. Induction of labour was performed according to the standard protocol of the hospital and the possibility of cesarean delivery was calculated using the PENN score.

Results:

Total of 353 pregnant women were studied. Positive correlation between probability of Caesarean delivery risk score and gestational period, weight, BMI and negative correlation with maternal age, height, modified Bishop score were observed. The studied AUC for this replica to speculate cesarean delivery as an effect of induction of labor was 80.68% with a highest YODEN'S INDEX of 51.84 with probability of caesarean risk cut off value estimated to be 37% with a sensitivity 65.13% and specificity 86.71%.

Conclusion:

This predictive model can be used as an prognostic model to prophesy the odds of risk of cesarean delivery in women undergoing induction.

Key Words: Induction, PENN score, Cesarean delivery, Bishop score, Calculator.

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INTRODUCTION

"Induction of labor defined as initiation of uterine contractions by any method for the purpose of vaginal delivery[1]," Hippocrates narrated regarding this in 400 B.C. **Commendation by Dr. Michael Robson: "The decision to induce labor is made if ending the pregnancy is considered more beneficial for the mother or the baby than awaiting spontaneous onset of labor, to obtain a safe vaginal delivery for mother and the baby with minimum interventions, complications and maximum satisfaction[2].** It is a common obstetrical procedure, involving nearly 20% of all deliveries, and the rates are increasing[3]. "The WHO Global Survey on Maternal and Perinatal Health, conducted in 24 countries showed that 9.6% were delivered by labor induction"[4].In United States the induction rate ranges from 9.5% to 33.7%[5]. The rate of induction in India is being reported as 11.4%(Misra and Vavre, 1994)[6].

The timing of delivery needs to be balanced between mother and perinatal risks. Perinatal morbidity and mortality and maternal complications like Pre-eclampsia, PPH and cesarean delivery increase with increasing weeks of gestation[7]. The rise in the induction rate is contributed by certain factors like post term pregnancy induction, a rising shift towards elective induction and due to rise in number of medical and obstetrical indicated inductions[8]. According to National Vital Statistics (CDC) rate of labor induction in 2012 is 23.3% with 90% increase in post term births[9].Induction of labor has certain advantages like reduction in the risk of intrauterine fetal death, still births, sepsis and need of cesarean section and also certain risks like uterine hyper stimulation, increased rates of operative deliveries and

cesarean sections, fetal heart rate pattern abnormalities, PPH and use of additional uterotonic drugs[10].

Maternal factors like BMI, gestational age, parity, cervical assessment and estimated fetal weight are important predictors of labor induction[11].Cervical assessment is the most important predictor to determine the induction success. Multiple authors have used alternate methods like Transvaginal Ultrasound imaging parameters in the prediction of induction success .Besides elevated fetal fibronectin concentrations have also been experimented for predicting labor induction. But high cost and poor predictions limits its usage[12]. phIGFBP-1 is also a strong factor that predicts successful induction of labor and is similar to Bishop score[13].

The cesarean section shows linear relationship with labor induction, with increased vaginal deliveries in early and surge in cesarean in the latter role of inductions[8]. Many studies found a twofold hike for caesarean section with induction of labor contrast to spontaneous labor[8]. Considering the global network an increase in the cesarean birth rates in India, were above the WHO recommended rate (>10–15%). South Asia including India showed an increase of 7.2 to 18.1% per year[14]. The 2015-16 NFHS found that 17% of live births in the five years before the survey were delivered by cesarean section.45% of the cesarean sections were decided on after the onset of labor pains, compared with 55% that were decided on before the onset of labor pains. Cesarean deliveries are more common among primigravida (24%) than the multigravida (2% to 16%). Since 2005-2006, the rate of cesarean section has doubled, from 9% to 17% in 2015-2016[15].

Predictive models involving variables like BMI, maternal height, Bishop score, nulliparity, macrosomia, gestational age, associated diseases and the predicted

overall cesarean section rate can be utilized in clinical practice that would enhance the chances of better management of induction of labor[16]. Selection and application of a authenticated calculator in clinical care to anticipate likelihood of cesarean delivery is also linked with decreased maternal morbidity[17,18]. The ideal time for labor induction is an important factor, since early induction may result in induction failure followed by cesarean section, whereas a delayed induction increases the higher gestational age associated maternal and fetal risk issues. Increased chance of Cesarean section after initiation of labor is linked with increased BMI, age, shorter height, an unfavorable Bishop score, diabetes mellitus, and hypertension, fetal or post term indications[19].

Multiple studies did not find any association between both. “In Obstetric Consensus Care Document from American College of Obstetricians and Gynecologist (ACOG) and Society for Maternal-Fetal Medicine (SMFM)” - induction of labor at gestation period of 41 weeks was observed to decrease the primary cesarean delivery[20]. In a study conducted at Norway, induction methods did not influence the cesarean delivery chances in women with induced labor[21]. Induction of labor was observed to enhance the chances of spontaneous vaginal delivery[22]. But still the efficiency of labor induction on cesarean delivery rates is controversial because it relies upon the balancing group[8]. In 2018, the ARRIVE trial showed no difference in the perinatal morbidity and reduced cesarean delivery rates in the low-risk induced primiparous women compared to those expectantly managed[7].Yet the estimate of cesarean delivery in the low-risk induced primiparous women is 19%[7].

Induction is usually not just a single intervention but is a complex set of interventions and, as such, is challenging for both clinicians and mothers. As with any other intervention, induction of labor is also associated with certain unwanted effects.

The potential to predict favorable outcome of induction is limited and despite the fact almost 33.33 % of inductions will resolute in a cesarean delivery[23]. Though various risk elements are associated with failure of induction, these risk elements solely are not sufficient enough to estimate, the actual chance of cesarean[23,24]. Prediction models and calculators provide an individualized risk assessment that would help in deciding the management. Many prediction models that are previously studied for induction is limited only to primiparous women and have found that favorable cervical assessment to be the most important predictor. Prediction of delivery outcomes for women with unfavorable cervical assessment remains understudied and a reliable predictive model still remains to be validated. Therefore, with the known risks associated with labor induction, it is clinically important to be able to precisely predict the chance of cesarean section following an induction of labor using a validated prediction model.

Hence from the above studies, the present day study is designed to assess the possibility of cesarean delivery and also the predictive accuracy following induction of labor by utilizing a validated web based calculator – The Penn Score.

OBJECTIVES

To assess the possibility of cesarean delivery and also the predictive accuracy following induction of labor by utilizing a validated web based calculator – THE PENN SCORE.

REVIEW OF LITERATURE

As per most studies the induction rate varies from 9 – 33%[25] .Labor is induced in 1 of 5 births for maternal reasons (e.g..Hypertensive disorders of pregnancy, GDM, Cardiac or Renal diseases), Fetal reasons(e.g..FGR) or a combination (e.g..PROM , post term pregnancy)[26]. Induction when is done for relevant purpose and by correct procedure it is convenient and profits both mothers and newborns[27]. It is a medical intervention and might result in undesirable consequences like increased rates of cesarean delivery , PPH, fetal distress, prolonged labor, increased instrumental delivery , neonatal jaundice , immediate care of newborn and medical care cost[25].The indication must be persuasive, captivating, accepted and archived. The need for induction and procedure must be talk about with the patient[27].The description of the patient , related co morbidities , membrane status , cervical condition , technique of labor induction must be appraised. It should be done after taking an informed written consent[28]. It should be carried out in a health centre where provisions for emergency cesarean section and guidance for hurdles is available and must be executed under observation. During labor induction mother and fetus status must be monitored and labor advancement must be catalogued. Prior to induction certain pre-requisites should be followed[28]:

- Detailed review of maternal history.
- Assessment for manifestation and to preclude any contraindication.
- Definitive assessment of gestational age, presentation and estimated birth weight.
- Maternal PR, BP, T, RR and data of obstetric examination should be taken down .
- Estimation of baseline FHR.
- Maternal pelvic analysis and clinical consideration for possibility of CPD.

- Analysis of cervical condition by Modified Bishop scoring approach to prophesy the chance of induction successfulness.
- Guide for induction, gestational age and Modified Bishop Score should be tabulated during the verdict for labor induction is made.
- Informed written consent should be taken.

Post term pregnancy, Oligohydramnios, Hypertension in pregnancy, FGR, Intrauterine fetal death, GDM and PROM or termination of pregnancy due to medical disorder are the common indications of undergoing labor induction[6]. Induction of labor is routinely practiced obstetric procedure where failed inductions and failure to progress in labor are the important contributors for increased cesarean rates[29].

Methods of labor induction

There are various methods of induction including pharmacological and mechanical methods. Amniotomy was introduced in the year 1810 and pituitary extract was applied for labor induction in the year 1913. Oxytocin, the important component of pituitary extract was later used as intravenous infusion with synthetic oxytocin discovered in the year 1955. Prostaglandins were also discovered to effectively impart labor induction. None of the induction method possess overall superiority considering maternal and neonatal outcomes .Randomized clinical trials (N=96) following different modes of induction including misoprostol, dinoprostone, and Foley catheter were included for metaanalysis[30]. Vaginal delivery was achieved within 24 hrs of administration of vaginal misoprostol but was linked with hyper stimulation of uterus with fetal heart rate changes. Labor induction using Foley catheter was associated with decreased occurrence of uterine hyper stimulation with fetal heart rate changes[30]. Stripping of membranes is one of the best studied methods

for labor induction following cervical ripening. Multiple studies support the application of membrane stripping but are associated with risks like premature membrane rupture, infection and placental bleeding[31].

Mechanical methods.

Mechanical methods includes balloon catheters, amniotomy and laminaria which stimulate prostaglandins release that in turn initiates labor induction. Artificial rupture of the amniotic membranes termed as amniotomy results in prostaglandin release that result in labor within 6 hours. The success of amniotomy has been observed in 90% of women in term. Early amniotomy followed by cervical ripening reduces the time between induction and delivery and the method is not related with the risk of cesarean delivery[32]. On the contrary delayed amniotomy after 8 hours of oxytocin administration resulted in higher chances of cesarean delivery[33].

Pharmacological Methods.

Prostaglandins:

The most commonly used induction agents belong to the class of prostaglandins, which are group of 20 carbon polyunsaturated fatty acids with a common precursor called arachidonic acid. PGE1 (misprostol) and PGE2 (dinoprostone) are clinically used for induction of labor[28]. The benefits of misoprostol are its stability at room temperature, rapid onset of action, multiple potential routes of administration, and low cost. These potential advantages make it as an alternative to PGE2. PGE2 is available in 3 different preparations: controlled release gel, intra-vaginal gel and intra-cervical gel[27].

Oxytocin:

Oxytocin, a cyclic nonapeptide is synthesized in supraoptic and paraventricular nuclei as a precursor molecule which is cleaved in the posterior pituitary. Oxytocin exists in association with neurophysin, which on stimuli is released into the plasma[34]. Oxytocin binds to its receptor leading to an enhanced prostaglandin synthesis. This property is used in labor induction, where intravenous administration of synthetic oxytocin enhances prostaglandin release. Parameters such as dosage, length of infusion, interval and frequency need to be optimized for successful labor induction[34]. It has a half life of 5 – 12 minutes and steady plasma concentration of 40 minutes and a steady state uterine response of 30 minutes or longer. The physiological dose of Oxytocin to produce regular uterine contractions is 8 to 12mU/min. The ideal dosing regimen of Oxytocin is not known and there are both low dose and high dose protocols[27]. The low dose regimen begins with 1 to 2 mU at 30 minutes intervals. The high dose regimen starts with 4 to 6 mU/minute with dose increments of 4 to 6mU/minute every 15 to 30 minutes. The low dose has benefits like less chances of tachysystole and the high dose has the advantage to reduce the length of labour. Continuous fetal monitoring is advised with use of Oxytocin[27].

Nitric oxide donors and Propranolol are the other agents that have been studied in relation to inductiuon of labour[(35-40)].

Assessment of cervix.

Prior to induction of labor, digital examination of the cervix as proposed by Bishop in the year 1964 predicts the induction success[27]. The initial scoring estimates 5 determinants through scoring with a maximum score of 13(Table 2)[27]. According to Modified Bishop Scoring, effacement is been replaced by cervical length in

centimeters and another modification is the modifiers[28]. It still remains as the typical prediction method for cervical assessment which is prejudiced and shows high inter and intra – observer variability. More of late the ultrasound analysis of cervix and other parameters are known to be as superior predictors than Bishop's score for induction success.TVS quantification like cervical length, posterior cervical angle, cervical wedging and occipital position are used to predict the success of induction[41].Bishop's score is prejudiced and is more painful in comparison to TVS. Of the TVS measurements cervical wedging and head position are not anticipating induction successfulness where as the cervical length and posterior cervical angle are the better variables in prediction of induction success[41]. The use of such measurements in standard obstetric use is not yet advocated.

Table 1: Bishop score

Score	Dilatation	Effacement	Station	Cervical position	Cervical consistency
0	0cms	0-30%	-3	Posterior	Firm
1	1-2 cms	40-50%	-2	Mid-position	Medium
2	3-4 cms	60-70%	-1,0	Anterior	Soft
3	5+ cms	≥80%	+1,+2		

Table 2: Modified Bishop Score.

Score	Dilation	Station	Position of cervix	Cervical consistency	Cervical length	Bishop Score Modifiers.
0	0	-3	Posterior	Firm	> 4	**Add 1 point for:** -Pre- Eclampsia. -Each previous vaginal delivery. **Subtract 1 point for:** -Postdate pregnancy. -Nulliparity. -PPROM.
1	1-2	-2	Midposition	Medium	3-4	
2	3-4	-1,0	Anterior	Soft	1-2	
3	5+	+1,+2			<1	

Risks factors of cesarean delivery following induction of labor :

Timing the labor induction is very crucial, where early induction leads to its failure and delayed induction increases fetal and maternal morbidity (Roos et al., 2010). Post term pregnancies beyond 41 weeks are linked with unfavorable results, therefore WHO recommends labor induction in women who are in postterm. In many cases, the patients, clinicians prefer elective cesarean section or expectant management rather than induction of labor. Three different modes of delivery, including elective cesarean section, induction of labour and expectant management were compared using two large WHO databases such as WHO Multi-country Survey (WHOMCS) and WHO Global Survey (WHOGS) performed at Asia, Africa, the Middle East and Latin America. No adverse pregnancy results were observed in induction and expectant group, whereas the expectant management group was associated with reduced cesarean section risk as compared to labor induction group[42]. Factors like Gestational age, Bishop score, BMI, short maternal height, Primiparous, increased birth weight are associated with increased risk of cesarean following induction of labor([43,44)]. Angle of progression at rest, sonographic fetal occiput position, cervical length before labor induction and maternal age are important predictors of induction of labor in women[45].

Table 3. Predictors and risk factors of cesarean delivery following induction of labor.

Study.	Assessment.	Pregnant women category	Significant Predictors	Reference
"Predicting cesarean delivery for failure to progress as an outcome of labor induction in term singleton pregnancy."	Bishop score, USG evaluation.	Term gestation.	Maternal age and sonographic fetal occiput position, angle of progression at rest, and cervical length.	45
"Transvaginal sonographic measurement of cervical length versus Bishop score in labor induction at term for prediction of caesarean delivery."	TVS evaluation	Term gestation.	-	46
"Induction of labor at 39 weeks and risk of cesarean delivery among obese women: a retrospective propensity score matched study."	-	Term gestation.	Obesity.	47
"Incidence of and Risk Factors for Failed Induction of Labor Using a Contemporary Definition."	-	Nulliparous women.	Shorter height, BMI and cervical dilatation of less than 2 cm on admission.	48
"Failed induction of labor and its associated factors in Ethiopia: A systematic review and meta-analysis."	Bishop Score	Women who underwent IOL	Primiparous. Bishop Score.	49
"Factors and outcomes associated with the induction of labor in referral hospitals of Amhara regional state, Ethiopia: a multicenter study."	Bishop Score	Women who underwent IOL	Bishop score, prolonged latent phase, induction with oxytocin, nulliparity, post term pregnancy and hypertensive disorder of pregnancy.	50
"Predicting factors of failed induction of labor in three hospitals of Southwest Ethiopia: a cross-sectional study"	-	-	Primiparous, poor Bishop Score, EFW ≥ 4 kg and body mass index.	51
"Caesarean risk factors during labor for a class III obese nulliparous."	-	Nulliparous women	Extreme BMI, age, oxytocin use.	52
"Study of the Risk Factors for Cesarean Delivery in Induced Labors at Term."	-	Term gestation.	Increased maternal age at delivery (≥35 years), early pregnancy, body mass index (≥30 kg/m(2)), nulliparity, low preinduction Bishops score (<5), gestational diabetes mellitus, and FGR.	53
"Predicting Vaginal Delivery in Nulliparous Women Undergoing Induction of Labor at Term."	Ultrasound	Nulliparous women	Risk variables.	54

Models and calculators to predict risk of cesarean section following labor induction.

Prediction models that utilize the risk factors to calculate the success and failure of induction of labor have been employed in various regards[24]. A large scale of risk calculators exist, where application of multiple calculators including NICHD, VBAC, induction of labor calculators should be employed rather than relying on a single calculator. The final outcome of these calculators should be employed in counseling the patients. The percentage likelihood of delivering by cesarean section calculated from these calculators is not a distinct cutoff value, and must not be used in opting induction of labor or elective cesarean delivery[24].

Comparison with a validated set such as the data from "Consortium for Safe Labor database" (a publicly available NIH database) encompassing electronic medical information about labor and delivery of more than 2,00,000 cases from 19 United States hospitals over the period of 2002 to 2008[55]. Bivariate analysis of pregnant women with unfavorable cervix were found to be linked with modified Bishop scores, weight gain during pregnancy, maternal height, race, chronic hypertension, pre-existing diabetes, BMI at delivery, gestational age at induction, parity, indication for induction and cervical dilation at initiation of induction which were employed in the evolution of prognostic model. Multivariate analysis of the model observed that gestational age of more than 40 weeks at induction, nulliparity, BMI, height and modified Bishop Score were significantly associated with risk of cesarean following induction of labor. Cervical dilation at induction and method of induction were not found to be linked with cesarean delivery. This model was severely contended by Abraham et al. where the study by Leviene et al.[24] never accounted for estimated fetal

weight at the start of induction, pelvic adequacy, demographics of the validation group and the usage of modified Bishop Score[56].

Predictive models based on cervical assessment have been found to significantly predictive in nature, with inclusion of body mass index, height, occiput position, cervical length measurement, posterior cervical angle measurement have been included as positive predictors of cesarean delivery following induction of labor[(57,58)]. In a cohort study involving 1610 induced pregnant women, the application of cesarean risk calculator was linked with a 6% maternal morbidity reduction and 8% reduction in cesarean delivery[59]. Pregnant term women (8,466) with an unfavorable cervix and singleton pregnancies were included in the study, where the cesarean probability increased with labor length with significant increase in maternal and neonatal morbidity[60].

Table 4. Predictive models and calculators for calculating the risk of cesarean delivery following induction of labor.

Study.	Model	Factors	Calculator	Reference
"A validated calculator to estimate risk of cesarean after an induction of labor with an unfavorable cervix."	Multivariable modeling Nomogram and calculator	Nulliparity, gestation age ≥40 weeks, body mass index at delivery, modified Bishop score, height	http://www.uphs.upenn.edu/obgyn/labor-induction-calculator/	24
"Using the probability of Cesarean from a Validated Cesarean Prediction Calculator to Predict Labor Length and Morbidity."	Validated prediction model	Longer labor length	http://www.uphs.upenn.edu/obgyn/labor-induction-calculator/	60
"Risk Calculator to Predict Cesarean Delivery Among Women Undergoing Induction of Labor."	Seven-variable predictive model	Previous vaginal delivery, delivery weight, height, ,age and others	https://ob.tools/iol-calc.	8

"Predicting Cesarean Delivery After Induction of Labor Among Nulliparous Women at Term."	Nomogram	Higher age, maternal stature, BMI, excessive weight gain, increased gestational age and others.	-	20

Eight different variables including maternal race, gestational age, parity, obesity, maternal age, fibroids, history of herpes, excessive fetal growth were used in developing prediction model designed by Danilack et al…, This model uses factors that included parameters assessed before the start of the induction to prophecy chance of cesarean delivery after labor induction. Area under curve generated for receiving operating characteristic curve was 0.82 on internal validation as well as external validation[61].

Branger et al [62] used six significant variables such as history of scarred uterus, use of prostaglandins, Bishop score<6, small size of mother, posterior release and nulliparity in univariate analysis. Multivariate analysis of significant parameters nulliparity, maternal BMI, size, Bishop score and scare uterus yielded an area under curve of 0.86 with 67.6% chance of cesarean delivery following induction of labor. Nwabuobi et al [63] generated a prediction model to assess the threat factors of cesarean delivery following induction of labor in non-reassuring FHR tracing in pregnancies with a small for gestational age fetus. Gestational and maternal age, starting technique of labor induction and age at delivery were included in the model. AUC of the final prognostic model was 0.82 with 64.2% sensitivity and 86.9% specificity. Non-reassuring FHR tracing pregnancies possessed significant risk factors such as gestational age at delivery, abnormal umbilical artery Doppler studies and

estimated fetal weight below 5th percentile that are included in the prediction model with a 0.69 AUC and 97% specificity.

Mathematical model derived using parameters including prior vaginal delivery, height, BMI before delivery, ultrasound estimated fetal weight and ultrasonographic cervical length generated an area under curve of 0.826, with better sensitivity (44.1%), specificity (94.9%), positive (8.7) and negative (0.59) likelihood ratios. This model combining ultrasonographic and clinical characteristics could recommend counseling women undergoing induction of labor [64].

Another study involving 19,844,580 live births in the U.S during the period of 2012-2016 witnessed 4,177,644 women with single gestations undergoing labor induction. Around 19.2% (800, 423) women underwent cesarean deliveries, with seven parameters were considered for the model. The authors suggest use of Bishop Score along with the seven parameter model to assess and counsel the chance of cesarean delivery following labor induction[18]. Jochum et al [65] studied a French population, where BMI, gestational age, height, parity, effacement, medical indication, dilation, premature rupture of membranes, suspicion of macrosomia, concerning fetal status and fetal head station were strongly linked with cesarean delivery in a multivariate analysis.

Quantitative evaluation of cesarean delivery risk calculator or through models has increased positivity in terms of clinical perspective. But there are multitudes of factors that facilitate or hinder the implementation of quantitative evaluation in clinical settings. Additionally, the calculations based on the calculator or model is largely decided by clinicians or through clinician-patient interactions.

MATERIALS AND METHODS

Study setting:

The study is conducted in the Department of Obstetrics and Gynecology at "KAHER's Dr.Prabhakar Kore Charitable Hospital and Medical Research Centre", attached to "Jawaharlal Nehru Medical College", Belagavi.

Study design:

An Observational study

Study duration:

The study is conducted for a duration of 1 year and 6 months.

Study period:

1st January 2020 to 30th June 2021.

Objective :

To verify the probability of incidence of caesarean delivery using a validated calculator, PENN SCORE - Web –based calculator, after induction of labor.

Source of data:

All the term pregnant women admitted in the labor wards for induction at KAHER- DR. PRABHAKER KORE CHARITABLE HOSPITAL attached to J.N. Medical College, Belgaum.

Selection criteria:

Inclusion criteria-

- Term, Single, Vertex presentation.
- Live fetus.

Exclusion criteria-

- Pre Term.
- Prior cesarean delivery.
- Multiple gestation.
- Breech and other abnormal presentation.
- Abruptio - Placenta.
- IUD.

Ethical clearance:

The study was approved by "Ethical and Research Committee, prior to its commencement.

(Annexure-1)

Methodology:

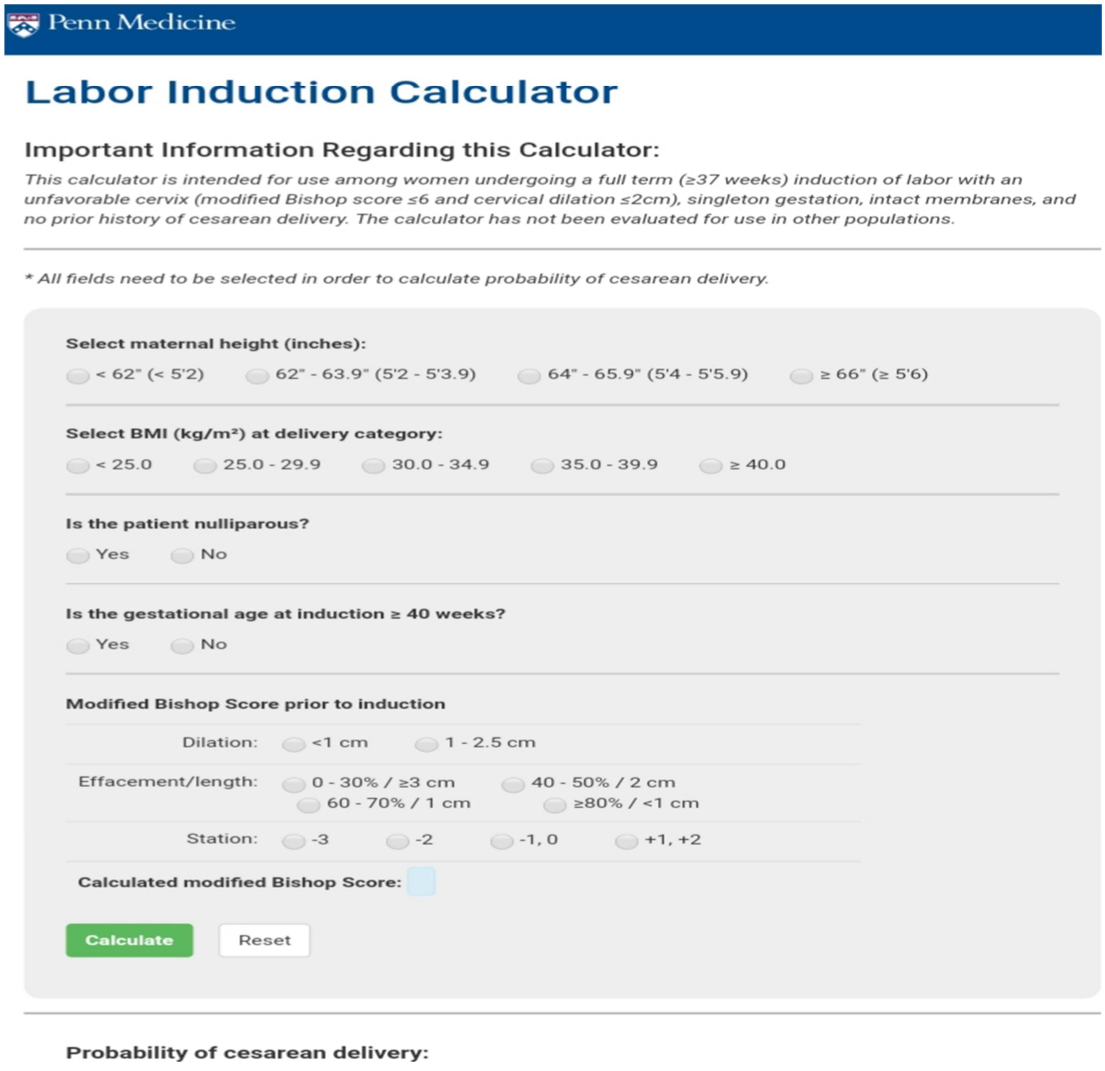
The study is a prospective observational study being conducted in the labor wards of KAHER-DR. PRABHAKAR KORE CHARITABLE HOSPITAL attached to J.N. Medical College, Belagavi, from January 2020 to June 2021.

Prior to induction an induction consent would be obtained, basic requirements and contraindications for induction would be assessed. Basic assessment (detailed antenatal history followed by pelvic assessment) would be done and after meeting the inclusive and the exclusive criteria the patient would be included in the study. Pre-

induction assessment would be done for all patients undergoing induction of labor and Bishop's score is assigned:

- 0-5: unfavorable.
- 6-13: favorable.

Labor induction is done according to the hospital protocol: 3 doses of dinoprostone gel 6 hours apart or misoprostol 25mcg every 4^{th} hourly up to 6 doses. A validated calculator: A Web- based calculator, PENN MEDICINE, would be used and the probability of cesarean delivery would be assessed. In the calculator, the following variables were considered as follows.



Penn Medicine

Labor Induction Calculator

Important Information Regarding this Calculator:

This calculator is intended for use among women undergoing a full term (≥37 weeks) induction of labor with an unfavorable cervix (modified Bishop score ≤6 and cervical dilation ≤2cm), singleton gestation, intact membranes, and no prior history of cesarean delivery. The calculator has not been evaluated for use in other populations.

** All fields need to be selected in order to calculate probability of cesarean delivery.*

Select maternal height (inches):

< 62" (< 5'2) | 62" - 63.9" (5'2 - 5'3.9) | 64" - 65.9" (5'4 - 5'5.9) | ≥ 66" (≥ 5'6)

Select BMI (kg/m²) at delivery category:

< 25.0 | 25.0 - 29.9 | 30.0 - 34.9 | 35.0 - 39.9 | ≥ 40.0

Is the patient nulliparous?

Yes | No

Is the gestational age at induction ≥ 40 weeks?

Yes | No

Modified Bishop Score prior to induction

Dilation: <1 cm | 1 - 2.5 cm

Effacement/length: 0 - 30% / ≥3 cm | 40 - 50% / 2 cm | 60 - 70% / 1 cm | ≥80% / <1 cm

Station: -3 | -2 | -1, 0 | +1, +2

Calculated modified Bishop Score:

Calculate | Reset

Probability of cesarean delivery:

SAMPLE SIZE:

The minimum sample size formula based on prevalence rate is

$$n = \frac{z_\alpha^2 P(1-P)}{d^2}$$

where P is the percentage of prevalence and d is the percentage likely difference in the prevalence.

z_α is linked with the level of significance. For 5% level of the significance $z_\alpha = 1.96$.

Ref:

With P = 32.7% and d = 15% of P = 4.91%, the sample size is n=351

STATISTICAL ANALYSIS:

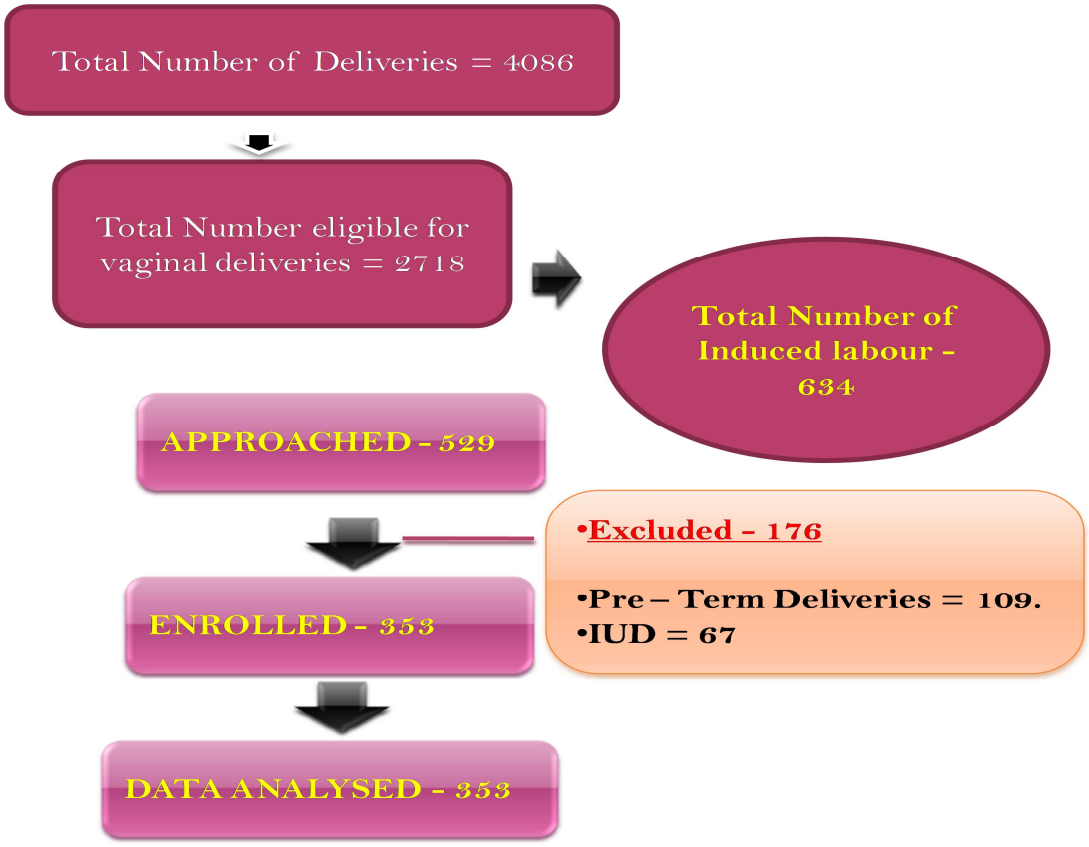
Since the study is of observational study the plan of analysis will be as follows. For the continuous quantitative variables mean and standard deviation will be calculated. For the purpose of comparison if the data is divided into two groups with respect to certain qualitative characteristic, the continuous variables will be compared using suitable tools of statistics like student's unpaired t test. The pre and post treatment measures will be compared using student's paired t test. Discrete variables will be represented by median. The categorical data will be expressed in terms of rates, ratios and percentages. For discrete variables nonparametric tests will be used. Apart from the above suitable tools like ANOVA, correlation, regression etc., will be used according to the need. For all the tests the value of p less than 5% (0.05) will be considered significant.

Following collection of data, analysis was performed by one-way ANOVA, Welsch's t test, Spearman's rank Correlation test and multiple linear regression model. After the selection of objective variables predicting the risk of cesarean delivery after induction of labor, receiver operating characteristic (ROC) curve was constructed to validate the accuracy of the devised model. The predicted probability of cesarean delivery was used as the predictive variable with the actual occurrence of cesarean delivery as the tested outcome. The area under the ROC curve (AUC) depicting the predictive performance of the model, specificity and sensitivity and statistically significant differences were calculated.

RESULTS

In a total of 4086 deliveries during the study period, 2718 participants were eligible for vaginal deliveries. Of these deliveries, 634 were induced labour and 2084 were spontaneous labour. Of the total induced labour, 353 deliveries were enrolled in the study as they fulfilled the inclusion criteria. A total of 176 cases were excluded as they fell under the category of preterm deliveries (n=109) and IUD (n=67). The final 353 pregnancies contributed to the analysis (Figure 1).

Figure 1 – Strobe diagram of the study.



Distribution according to Age

Large percentage of pregnant women included in the study fell in the age group of 21-25 (57.51%) followed by 30.03% and 10.48% cases belonging to 26-30 and 31-35 years of age respectively. A very meagre percentage of 0.57% women were less than 20 years of age and 1.42% women were of advanced age (36-40 years old). (Table 5)

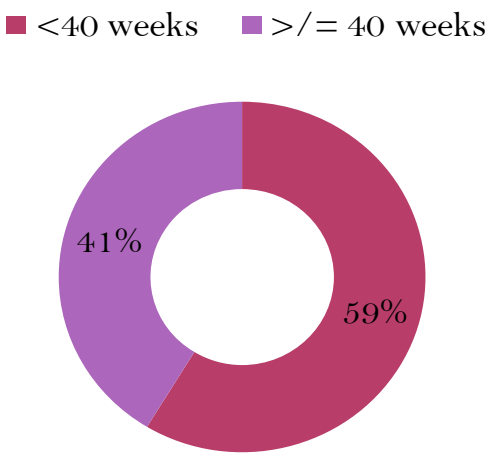
Table 5 - Distribution according to Age

AGE (in years)	NUMBER	PERCENTAGE
<20	2	0.57
21-25	203	57.51
26-30	106	30.03
31-35	37	10.48
36-40	5	1.42
TOTAL	353	100.00

Distribution according to Gestational Age

In relation to the gestational age, 207 cases (58.64%) were less than 40 weeks and 41.36% (n=146) were more than or equal to 40 weeks (Figure 2).

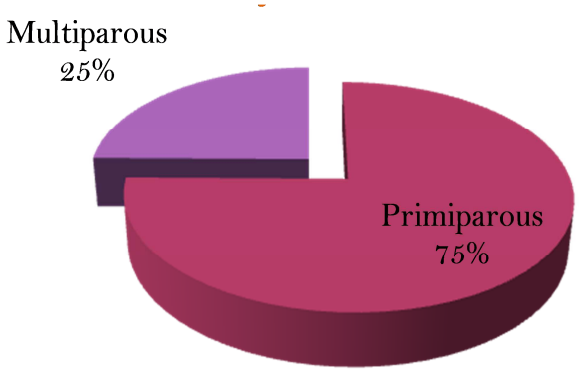
Figure 2: Distribution based on the gestational age of women.



Distribution according to Parity

The study revealed that 74.50% (n=263) and 25.5% (n= 90) of pregnant women were primiparous and multiparous respectively (Figure 3)

Figure 3: Distribution of pregnant women based on parity



Distribution according to BMI category

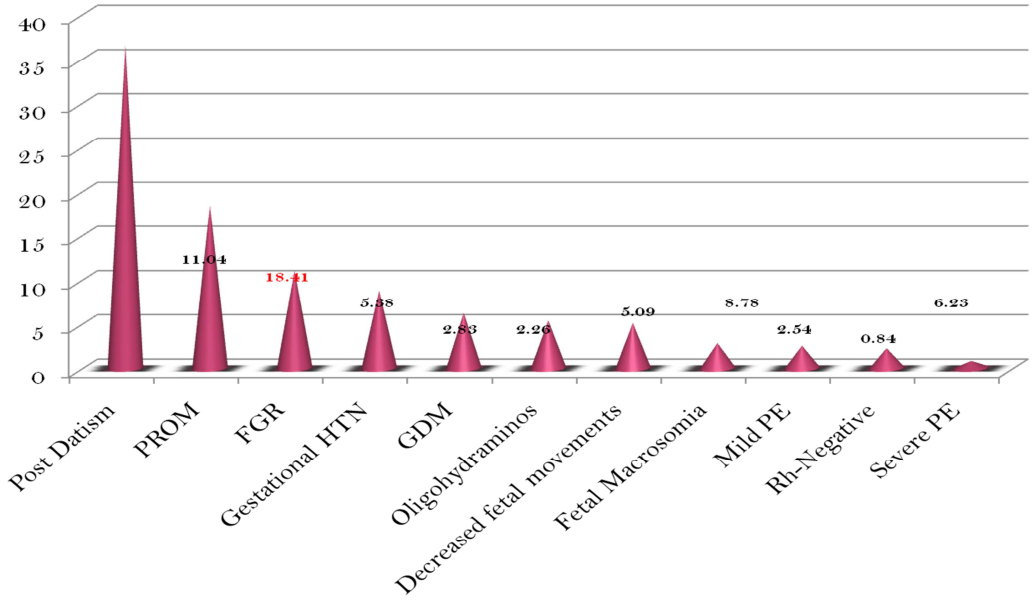
Pregnant women enrolled in the study fell under the three categories of BMI, where a majority of 56.09% (n=198) belonged to the BMI category normal weight (2) (19-24.9). Under the BMI category of overweight (3) (25-29.9) there were 38.81% (n=137) pregnant women and a minor percentage of 5.1% (n=18) were in the BMI category of obese (4) (≥ 30) (Figure 4).

Figure 4: Distribution of pregnant women based on BMI category.

Indications for Induction of Labour

The most common indications for induction of labor include post datism (36.54%) followed by PROM (18.41%) and fetal growth restriction, FGR (11.04%). Gestational hypertension (8.78%) and gestational diabetes mellitus (6.23%) were the other major indications for induction of labor. Oligohydraminos, decreased fetal movements, Rh negativity, fetal macrosomia, mild and severe PE mildly contributed to the induction of labor (Figure 5).

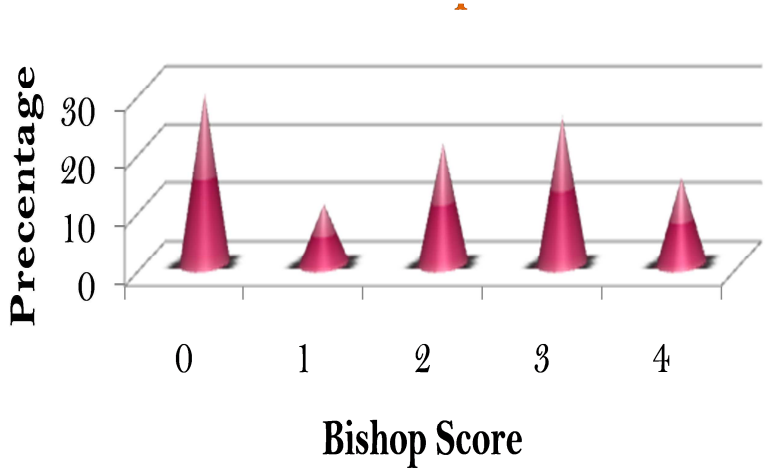
Figure 5: Bar diagram depicting the indications for induction of labor



Distribution according to Calculated Modified Bishop score

All patients subjected to Bishop scoring were categorized as 29.18% (Score 0), 10.20% (Score 1), 20.68% (Score 2), 25.21% (Score 3) and 14.73% (Score 4) (Figure 6).

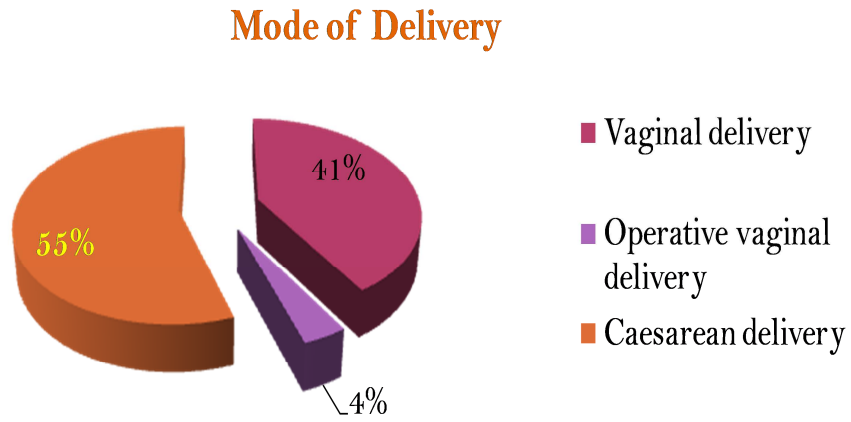
Figure 6: Bar diagram depicting the distribution of Calculated Modified Bishop score.



Distribution according to Mode of delivery

Nearly 41.08% (n= 145) of the pregnant women delivered vaginally, 3.68% (n=13) had Ventouse delivery and larger proportion of 55.24% (n=195)had Caesarean delivery (Figure 7).

Figure 7 : Distribution according to Mode of delivery



Baseline Characteristics of The Study Population

Women who delivered had a mean age of 24.68± 3.6 and more likely were primiparous (74.5%) and 25.5% were multiparous, the mean gestational age of study group was 39.24±1.37 weeks. The mean height and weight of the study population is 155.2±3.7 cm and 60.52±5.2 kg respectively. Larger percentage of the study population (56.7%) fell in the BMI category of 19-24.9, followed by 38.2% in 25-29.9 BMI and 5.0% belonged to more than 30 BMI. The mean BMI was 25.16± 2.2.(Table 6).

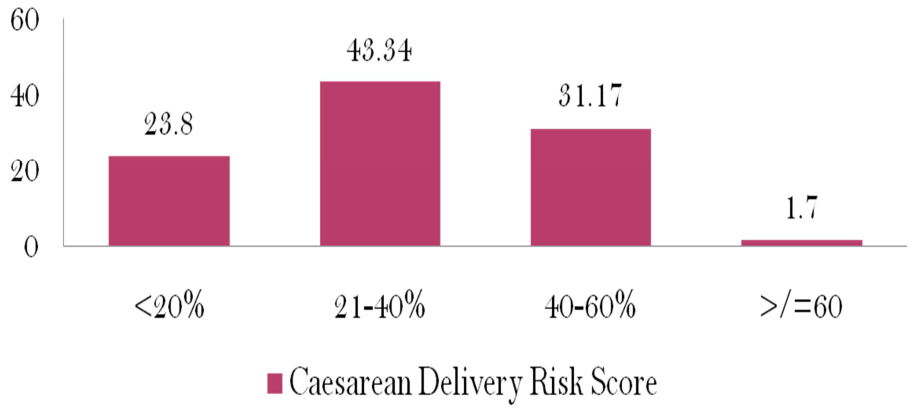
Table 6: Baseline characteristics of the study population

PARAMETER	SUB - CATEGORY	No. of Subjects
AGE	Mean ± SD Median (Min, Max)	24.68 ± 3.6 24 (19,38)
PARITY	Primiparous. Multiparous.	263 (74.5%) 90(25.5%)
POG	Mean ± SD Median (Min, Max)	39.24 ± 1.37 39.42 (37, 41.85)
HEIGHT	Mean ± SD Median (Min, Max)	155.2 ± 3.7 156 (144, 162)
WEIGHT	Mean ± SD Median (Min, Max)	60.52 ± 5.2 60 (46,83)
BMI	19-24.9	199 (56.7%)
	25-29.9	136 (38.2%)
	≥30	18 (5.0%)
	Mean ± SD Median (Min, Max)	25.16 ± 2.2 24.8 (19.4, 33.3)

Distribution according to Probability of Caesarean risk Score.

More than 43.34% of the study population had a Caesarean delivery risk score of 21-40%, followed by 31.17% pregnant women falling in the 41-60% risk score. 23.8% of the study group had less than 20% Caesarean delivery risk score and only 1.7% had more than 60% risk score.(Figure 8).

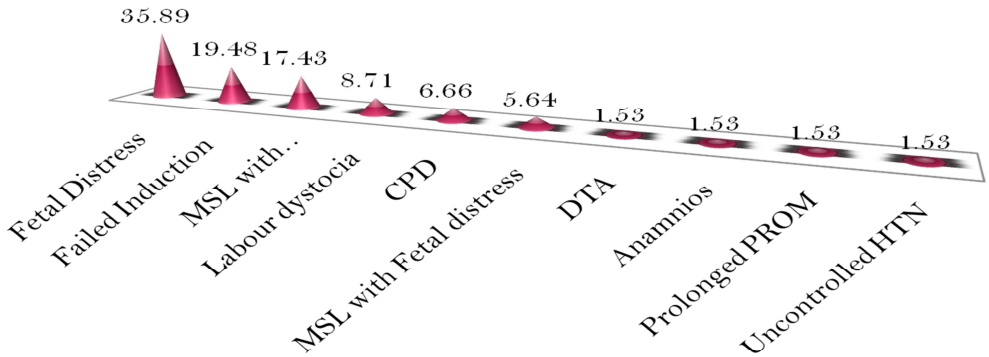
Figure 8: Distribution according to Probability of Caesarean risk Score.



Indications for Caesarean section

Fetal distress (35.89%) was the major contributor for Caesarean section followed by failed induction (19.48%) and MSL with unfavourable cervix (17.43%). Labor dystocia (8.71%), CPD (6.66%) and MSL with fetal distress (5.64%) were the next major indicators of Caesarean section. Each of the indications namely DTA, prolonged PROM and uncontrolled HTN contributed to 1.53% cases (Figure 9).

Figure 9: Indications for Caesarean section.



Comparison of Caesarean section risk with different variables.

In the comparison of different variables including parity, BMI category and mode of delivery with the predicted Caesarean section risk score calculated, from Welch's t test, we observe that there is significant difference in mean Caesarean section risk over parity. There is significant difference in mean caesarean section risk over BMI category as per one-way ANOVA analysis (p-<0.0001).There is significant difference ((p-<0.0001)) in mean caesarean section risk over mode of delivery (Table 7).

Table 7: Comparison of Caesarean section risk with different variables

Variables	Sub-Category	Mean ± SD	Median (Min, Max)	p-value
Parity	Multiparous.	12.9 ± 6.6	11.1 (3.8,40.2)	<0.0001 Wt
	Primiparous.	39.10 ± 9.7	39.8 (9.7, 65.7)	
BMI category	19-24.9	33.06 ± 7.3	32.95 (7.9, 49.9)	<0.0001 A
	25-29.9	44.28 ± 6.7	45 (20.9, 56)	
	≥30	54.1 ± 7.8	55.6 (39.8, 69.8)	
Mode of Delivery	Caesarean delivery	39.1 ± 12.47	40.2 (6.6, 65.7)	<0.0001 A
	Normal delivery	23.8 ± 12.5	23.2 (3.8, 56)	
	Operative vaginal delivery	28.07 ± 13.2	27.9 (6.9, 51.1)	

Correlation of different variables with Caesarean section risk

Based on the Spearman's rank Correlation test (**Spearman correlation coefficient** denoted by ρ, rho), a significant positive correlation of weight (ρ, rho=0.4, p value <0.0001), BMI (ρ, rho =0.53, p value <0.0001) and gestational age (ρ, rho=0.09, p value =0.008) was associated with predicted Caesarean section risk score of which weight and BMI was statistically significant. Negative correlation was observed between Height (ρ, rho= -0.25, p value <0.0001), Modified BISHOP score (ρ, rho= -0.6, p value <0.0001), maternal age (ρ, rho= - 0.15, p value 0.005) and predicted Caesarean section risk score which was statistically significant (Table 8).

Table 8: Spearman's rank Correlation of different variables with Caesarean section risk

Variables	Spearman's rank Correlation Coefficient	p-value
Maternal Age (years)	**-0.15**	**0.005***
Gestation period	**0.09**	**0.08**
Height (cm)	**-0.25**	**<0.0001***
Weight (Kg)	**0.4**	**<0.0001***
BMI	**0.53**	**<0.0001***
Modified BISHOP score	**-0.6**	**<0.0001***

Multiple Linear Regression Model

Multiple linear regression analysis of the data indicated a significant effect of gestational age, height, weight and modified BISHOP score on Caesarean section risk. Caesarean section risk is 20.3832 times more with primiparous compared to the multiparous. Caesarean section risk increases by 1.89 with unit increase in gestational age. With unit increase in height, Caesarean section risk decreases by 0.53. Caesarean section risk increases by 2.03 with unit increase in BMI. With unit increase in Modified BISHOP score, Caesarean section risk decreases by a factor of 5.6 (Table 9). All the variables were found to be statistically significant.

Table 9: Multiple linear regression of parameters with Caesarean section risk

	ESTIMATE	P-value
(Intercept)	**1.03**	**0.97**
Parity	**20.3832**	**<0.001**
Gestational age	**1.89**	**<0.0001**
Height	**-0.53**	**0.0005**
BMI	**2.03**	**<0.0001**
Modified Bishop Score	**-5.606**	**<0.0001**

Association between Probability of Caesarean delivery risk score and Mode of delivery

In the association between Caesarean delivery risk score and the mode of delivery, Caesarean deliveries (n=195) contributed to higher risk, followed by vaginal delivery (n=145). Higher percentage of risk category 21-40% was observed in all the three modes of delivery. In the 41-60% risk group 96 cases were from Caesarean delivery and 60 cases from vaginal delivery was below 20% risk category (Table 10).

Table 10: Association between Probability of Caesarean delivery risk score and Mode of delivery

Caesarean delivery risk score(%).	Vaginal delivery	Operative vaginal delivery	Caesarean delivery	TOTAL
<20	60(71.42%)	3(3.57%)	21(25%)	84
21-40	74(48.36%)	7(4.57%)	72(47.05%)	153
41-60	11(10%)	3(2.72%)	96(87.27%)	110
>60	0(0%)	0(0%)	6(100%)	6
TOTAL	145	13	195	353

P value - <0.0001 (Highly Significant).

Delivery Percentage

Comparison of delivery revealed 74.99%, 52.93%, 27.7% vaginal delivery cases had less than 20%, 21-40% and 41-60% Caesarean section risk score respectively (Figure 10).

Figure 10: Association between delivery and Caesarean section risk score

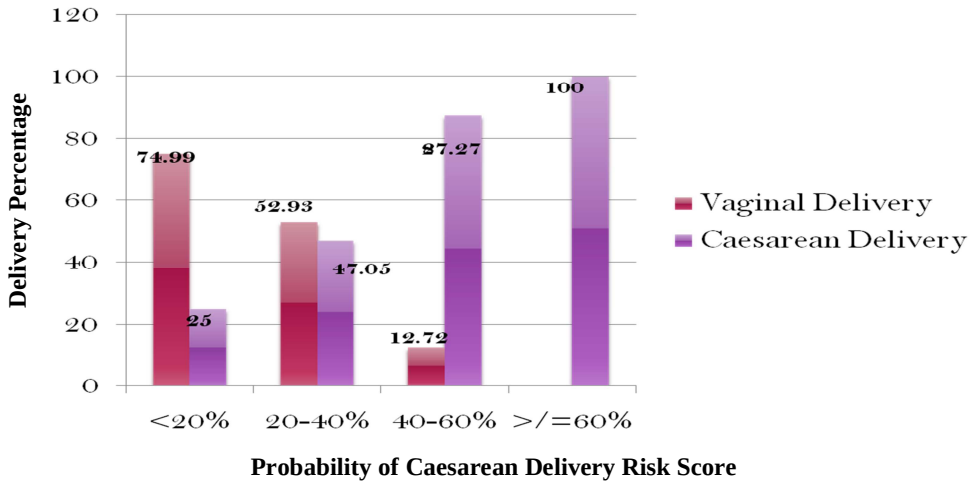
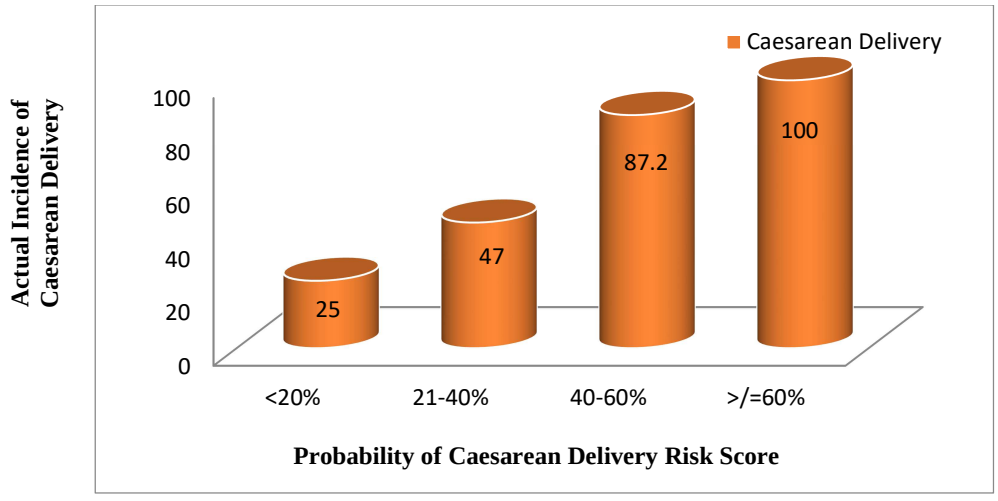


Figure 11: Association between actual incidence of Caesarean deliveries and Caesarean section risk score

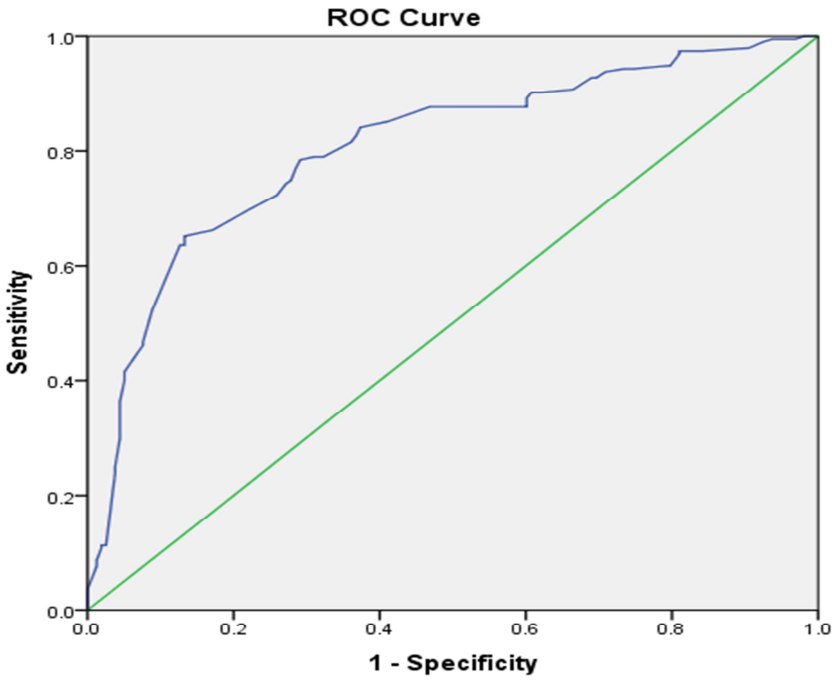
In the association between the actual incidence of Caesarean deliveries and predicted Caesarean section risk score, the actual incidence of cesarean delivery was found to be 25%, 47%, 87.2% and 100% in the risk group of < 20%, 21-40%, 41-60% and >60% respectively.



Receiver Operating Curve Analysis (ROC):

The calculated AUC for the model to predict cesarean delivery accurately as an outcome of induction of labor was 0.8068. A highest YODEN'S INDEX of 51.84 was observed. The probability of caesarean risk cut off value was estimated to be 37% with a sensitivity of 65.13% and a specificity of 86.71% (Figure 12).

Figure 12: Calculated area under the curve



DISCUSSION

Induction of labour, involves nearly 20% of all deliveries, of which it is nearly linked with 2 fold higher risk for caesarean delivery compared to spontaneous labor[3]. "Since 1985, the International Health Community has considered the ideal rate for caesarean section to be between 10% and 15%"[14]. In this observational study, the rate of induction is 15.5%. Of the total induced 353 deliveries that were enrolled in the study, following induction the incidence of vaginal and cesarean delivery were 45% and 55% respectively. Our study established that the common indications for induction of labor were post datism, FGR, PROM, oligohydraminos, fetal macrosomia, Rh negative, decreased fetal movements, gestational hypertension, mild and severe PE with post datism and PROM being the major contributors. Similarly the factors resulting in Caesarean section were failed induction, fetal distress, non-progression of labor, MSL with fetal distress, CPD, DTA, prolonged PROM, uncontrolled hypertension, anamnios and MSL with unfavourable cervix. Among them fetal distress (35.89%), failed induction (19.48%) and MSL with unfavourable cervix were the major contributors. In a cohort study involving 13,753 deliveries, the rate of induction was 19.4%, of which 29.4% had cesarean delivery. Non reassuring FHR was the most regular indicator for cesarean section accounting to 36.4%[48].

In the current study among the pregnant women who underwent labor induction, risk of cesarean delivery calculated using a well-validated cesarean prediction calculator was significantly correlated with age, parity, gestational period, weight, BMI, height and modified Bishop score. Our findings are concordant with the predictive model as proposed by Kawakita et al.([66,67)] and the nomogram by Tolcher et al. [20,67]

The current study showed that maternal age exhibits significant association with risk of Caesarean delivery where with increase in age an increased risk is observed. Numeral studies depicted that maternal age more than 30 years is tallied with higher rate of cesarean section. Mothers with age more than 30 were found to be at risk for failed induction. Increased rates of induction are observed with increase in age where it is 39% in 40-44 year old women and 58% in women ≥ 45 years old. In contrary, in a randomized trial of labor induction in 619 women aged 35 Years or Older, no important differences in the chance of Caesarean section was observed[68]. Similarly no maternal or infant mortality/morbidity or adverse neonatal or maternal outcomes was observed. But some studied associate the risk of perinatal mortality and multiple complications in women > 35 years which can be reduced by inducing the patients before the due date. Still birth has been found to be more in women with advanced age in contrast to younger women. Thus induction of labor at pre-due date has the ability to prevent still births[69]. Study by Mhaske et al.[53] also showed significant association between advancing age and cesarean delivery following induction. This finding is in concordant with other studies by Bayrampour et al.[70] and is in contrary to study done by Cnattingius et al.[71]

Our study showed nulliparous women are at significant risk for caesarean delivery compared to multiparous women. Nulliparous women are associated with 4.6 times more of having cesarean section than multiparous women[8]. This finding was similar to study done in Ethopia which revealed that primiparous women are 3.04 times more at risk of caesarean compared to multiparous women[10]. Study by Ehrenberg et al.[72] also revealed similar association between nulliparity and cesarean delivery. This association is concordant with other studies by Cnattinius et al.[71] and Mhaske et al.[53]

The current study revealed gestational age was positively correlated with risk of Caesarean delivery following induction of labor. This is supported by Rydhal et al.[73] where induction at 41(+0–6) gestational weeks was linked with increased Caesarean delivery risk. In a cross sectional study of labour induction in 719 women showed that gestational age of more than 40 weeks was associated with 1.5 times more cesarean sections than women with vaginal delivery. This finding is in contrary to other studies by Sanche – Ramos et al.[74] and Mhaske et al.[53]

The study also observed a significant positive correlation of weight (0.4) and BMI (0.53) with probability of Caesarean section risk. This was supported by many reports including a systematic review and meta-analysis of 10 different observational studies. Ellis et al.[75] observed that Caesarean section following induction of labor was common among obese women compared to normal weight women.It has been reported that more than 50% women who gave birth were obese (24.8%) or overweight (25.6%) as per BMI classification[76]. Additionally pregnancy related problems such as gestational hypertension and diabetes, still birth and fetal macrosomia were associated in obese women undergoing induction of labor[77].

Unsuccessful or failed induction of labor in pregnant women was associated with higher BMI, was observed in cohort study involving 80,887 cases where a BMI of 40 kg/m^2 had a more (29%) risk of failed labor induction in comparison to normal weight women (13% risk)[78].Teefey et al.,[79] observed BMI of 40-49.9 (81.8%), BMI of 50-59.9 (14.5%) and BMI of more than 60 (3.7%) were included in the study with an overall Caesarean section rate of 49.1%. Increase in BMI is associated with increased Caesarean delivery, where BMI of 40-49.9, 50-59.9 and ≥60 had a Caesarean delivery of 46%, 63% and 69% respectively.

Obesity as a single factor increased risk even with other controlled parameters such as parity, maternal age, maternal weight gain, fetal macrosomia and dilation of cervix. Obesity was also linked with increased maternal morbidity such as post-operative complications, reduced wound healing and infection and neonatal morbidity such as longer NICU admission and arterial cord pH of 7.15 or less[79,80]. Study by Poobalan et al.[81] in a systematic review concluded that cesarean delivery risk increases by 50% in over weight women and is more than double for obese women compared to women with normal BMI. This association is in concordant to other studies by Sheiner et al.[82] and Ehrenber et al.[72] and Mhaske et al.[53]

The current study showed that significant negative correlation exists between height and pre-induction modified Bishop score with the predicted cesarean delivery risk. Study by Mhaske et al.[53] showed that low pre - induction Bishop score exhibits significant association with cesarean delivery. Similar results were seen in study done by Johnson et al.[83]

Univariate analysis observed that BMI, nulliparity, reduced maternal height, preterm and modified Bishop score were linked with higher cesarean delivery rate. Increased probability of cesarean delivery after induction of labor has been associated with BMI, height, race, age, cervical length, fetal weight, gestational age, parity with conflicting results with Bishop score. In a study with a total of 537 women with 17% Caesarean deliveries, transvaginal ultrasonographic cervical length was linked with the increased chance of cesarean delivery[84]. Uyar et al., evaluated the role of ultrasonographic and various fetal and maternal factors in the prediction of successful labor induction showed that in 189 singleton pregnant women of 37–42 weeks of gestation showed that Cervical length and BMI were the independent variables and predicted the success of induction much better the Bishop score.

The current study observed that Caesarean section risk is 20.3832 times more with primiparity than multiparity, 1.89 times more with increased gestational age, 0.53 fold lesser with unit increase in height, 2.03 fold higher with unit increase in BMI and 5.6 times lower with unit increase in modified Bishop Score. Similar results were obtained in a study where two fold increased Caesarean risk linked with BMI of 50-59.9 compared to BMI of 40-49.9, 4.8 fold higher in nulliparous compared to multiparaous women, 15% increased risk with an inch increase in height[79]. Ronzoni et al observed a 2.5 fold increase in Caesarean risk delivery after labor induction in obese women compared to non obese pregnant women[80].

In study done by Kawakita et al. observed that of 10,591 nulliparous women who underwent labour induction, 77.4% women delivered by vaginal delivery. This model identified maternal age, race, gestational age at delivery, maternal height, pre-pregnancy weight, gestational weight gain, bishop score, chronic hypertension, gestational diabetes mellitus as significant predictors of labour induction[66].

Our study observed that PENN SCORE can be used as a calculator to study the chance of Caesarean delivery following induction of labor with calculated AUC of 0.8068, a highest YODEN'S INDEX of 51.84, sensitivity and specificity of 65.13% and 86.71% respectively. All the parameters listed in the PENN Medicine calculator were found to be significant risk factors in determining predicted Caesarean delivery risk as an outcome of induction of labor. In a cohort study involving labour induction in nulliparous, term, singleton, cephalic pregnancies eight predictors were importantly linked with cesarean delivery in multivariate modeling. Every 5-year rise in maternal age, 5-kg/m2 increase in BMI was correlated with 26% and 41% rise in cesarean delivery respectively. Hypertension, gestational and pre-

gestational diabetes were related with twofold chance of cesarean delivery. The predictive accuracy of this model was 72%[20].

In a study conducted at University of Pennsylvania using the similar calculator showed that escalating rise of cesarean was kindred with increased duration of labor and surge in maternal and neonatal morbidity. Women with speculated chances of cesarean of > 60% were associated with 3 fold risk of maternal morbidity in contrast to with women with a foresee likelihood of <20%[60]. The predictive ability of the model as studied by Kawakita et al. as measured by the AUC was 75%[66]. In a normogram as devised by Mary Catherine et al. where among the 785 induced women, 29.4% women delivered by cesarean section. The study concluded that maternal age, maternal height, BMI, weight gain during pregnancy, gestational age, hypertension, diabetes mellitus, bishop score as independent risk factors associated with increased risk of cesarean delivery following induction. The final AUC for this predictive model was 70%[20]. In the study by Robert M Rossi et al.., the AUC for the seven variable predictive model was 78%[85].

In the study done by Rasha Kamel et al. in the prediction of cesarean delivery as an outcome of labour induction found that maternal age, sonographic fetal occiput position, angle of progression at rest and cervical length as good predictors of induction outcome[67]. Other predictive models employing TVS and maternal features have depicted anticipating precision with AUC of 76% and 67%[86]. Another replica merging clinical and sonographic features to foresee the chance of cesarean delivery has shown the AUC of 82% with 5% false-positivity, sensitivity 44.1%, specificity 94.9%, and positive (8.7) and negative (0.59) likelihood ratios[87].Similarly, in the study by Rasha Kamel et al. the calculated AUC of predictive model following labour induction was 88%[85].

However further studies are necessary, comparing the clinical and the sonographic predictors in women undergoing labour induction. In a prospective study by Vallikkannu et al. done comparing the transvaginal sonography for cervical length measurement and digital bishop score assessment concluded that both were predictors of cesarean delivery with AUC 61% and 60% respectively. Cervical length had higher sensitivity and better positive and negative predictive values[46].

From the various prediction models, various risk factors such as maternal height, age, weight, parity, gestational age, Bishop score, gestational diabetes or hypertension have been significantly linked with cesarean delivery risk[18]. Prediction models that employ risk factors are of importance to study the Caesarean delivery risk following induction of labor, as prior discussion with the patients can be done and neonatal or maternal morbidity can be reduced.

The strengths of the study are, it includes both primiparous and multiparous women and only women with unfavorable Bishop score. The sample size is sufficient enough to verify the predictive accuracy of the calculator. The study is limited to the women who met inclusion criteria for our study and may not be generalizable to women who do not fit into these criteria. The study does not include other predictors of induction like the sonographic variables in prediction of labour induction. The inability to reliably predict cesarean with 100% accuracy is another limitation of the study. However, given the fact there will always be confounding by indication and also provider's clinical decision making to perform a cesarean delivery, and therefore achieving 100% accuracy in a prediction model would not be realistic.

CONCLUSION

The observational study involving 353 pregnant women (with term pregnancy, single, vertex presentation and live fetus) for a period of one year and six months in charitable hospital attached to J.N. Medical College, Belgaum revealed Maternal Age, Height, BMI, Parity, Gestational Age and Modified Calculated Bishop score to be important predictors of induction as similar to previous studies.

Positive correlation between probability of Caesarean delivery risk score and gestational period, weight, BMI and negative correlation with maternal age, height, modified Bishop score were observed. One way ANOVA, Welsch's t test, Multiple regression model validates the association between all the parameters of PENN SCORE calculator and the risk of Caesarean delivery. The studied AUC for this replica to speculate cesarean delivery as an effect of induction of labor was 0.8068 with a highest YODEN'S INDEX of 51.84. The probability of caesarean risk cut off value was estimated to be 37% with a sensitivity of 65.13% and a specificity of 86.71%. This predictive model – PENN SCORE, can be used as an prognostic model to prophesy the odds of risk of cesarean delivery in women undergoing induction of labour.

SUMMARY

The PENN medicine calculator was employed to anticipate the chance of Caesarean section delivery following induction of labor. The calculator employs maternal height, BMI, parity, gestational age and modified Bishop score prior to induction to calculate the probability of Caesarean delivery. Out of the 353 pregnancies included in the study, larger percentage (57.5%) of pregnant women was in the range of 20-25 years old. Around 30.03% of pregnant study population was in the 26-30 years. Pregnant women below 40 weeks of gestational age were 58.64% and 41.36% were more than or equal to 40 weeks of gestational age. The pregnant women in the study group were largely nulliparous (74.5%) and multiparous (25.5%). They were categorized in the BMI category normal weight (56.09%), Over weight (38.81%) and Obese (5.1%). The indications for induction of labor were post datism, FGR, PROM, oligohydraminos, fetal macrosomia, Rh negative, decreased fetal movements, gestational hypertension, mild and severe PE. The pregnant women enrolled in the study showed that 29.18% had a Bishop score of 0, 35.21% were score 3, 20.68% were score 2, 14.73% were score 4 and 10.2% were score 1 category.

The study population had Caesarean delivery in 195 cases (55.24%), vaginal delivery in 145 cases (41.08%) and ventouse delivery in 3.68% cases. The baseline characteristics of the pregnant women revealed a mean age of 24.68±3.6 years, mean gestational age of 39.24±1.37, mean height and weight of 155.2±3.7 cm and 60.52±5.2 kg respectively.

The Caesarean section risk score of 21-40% was observed in 153 cases (43.34%) and 41-60% risk in 110 cases (31.17%). Higher risk (> 60%) was observed at 1.7% and lower risk (< 20%) in 23.80% cases. The factors affecting the Caesarean section deliveries include failed induction, fetal distress, non-progression of labor,

MSL with fetal distress, CPD, DTA, prolonged PROM, uncontrolled hypertension, anamnios and MSL with unfavourable cervix. Among the indicators for Caesarean section, fetal distress (35.89%), failed induction (19.48%) and MSL with unfavourable cervix were the major contributors.

A significant association existed between parity (p value<0.0001), gestational period (p value=0.02), BMI (p value <0.0408). preinduction Bishop score (p value <0.0001) and the Caesarean delivery risk score. One way ANOVA, Welsch's t test confirmed the significant association of parity, BMI category and mode of delivery on the Caesarean risk.

Gestational period, weight and BMI were positively associated with Caesarean section risk, where a unit increase in the parameters resulted in increased risk. Maternal age, height and modified Bishop score were negatively correlated with the risk. Multiple regression model validates the association between all the parameters of PENN SCORE calculator and the risk of Caesarean delivery. Caesarean section risk is 20.3832 times more with primiparous compared to the multiparous. Caesarean section risk increases by 1.89 with unit increase in gestational age. With unit increase in height, Caesarean section risk decreases by 0.53. Caesarean section risk increases by 2.03 with unit increase in BMI. With unit increase in Modified BISHOP score, Caesarean section risk decreases by a factor of 5.6. The studied AUC for this replica to speculate cesarean delivery as an effect of induction of labor was 0.8068 with a highest YODEN'S INDEX of 51.84. The probability of caesarean risk cut off value was estimated to be 37% with a sensitivity of 65.13% and a specificity of 86.71%. The PENN SCORE calculator can be used to study the risk of Caesarean delivery following induction of labor.

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ANNEXURE I: ETHICAL CLEARANCE

K.L.E. ACADEMY OF HIGHER EDUCATION AND RESEARCH
(Deemed – to- be- University)
Accredited 'A' Grade by NAAC (2nd Cycle) Placed in Category 'A' by MHRD (GoI)
JAWAHARLAL NEHRU MEDICAL COLLEGE,
NEHRU NAGAR, BELAGAVI-590010 (KARNATAKA-INDIA)
Website: http//www.jnmc.edu
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Principal: 2471701
Fax No. +91 (0)831 – 2470759

Ref: MDC/DOME/ 212 **Date: 24/12/2019**

To,

REG NO: B J 0 1 1 9 0 1 9
PG student in Obstetrics and Gynaecology,
J.N.Medical College,
BELAGAVI.

Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"ASSESSMENT OF RISK OF CESAREAN DELIVERY FOLLOWING LABOR INDUCTION USING A VALIDATED CALCULATOR – A ONE YEAR OBSERVATIONAL STUDY",** is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Anita Dalal)
Member Secretary
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

(Dr. Roopa M Bellad)
Chairman,
JNMC Institutional Ethics Committee
on Human Subjects Research,
J.N.Medical College, Belagavi.

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ANNEXURE II – INFORMED CONSENT FORM.

MRS _____we are requesting you to enroll yourself in study title **"Assessment Of Risk Of Cesarean Delivery Following Labor Induction Using A Validated Calculator-A One Year Observational Study" conducted** by **REG NO: BJ0119019**, Post Graduate in M.S. Obstetrics and Gynecology under the guidance of **Dr. _____**, Department of Obstetrics and Gynecology, J.N. Medical College, Belagavi.

under KAHER, Belagavi.

Objective and Purpose of study:

Respected Madam, we request you to enroll yourself to participate in our study as you are eligible for participating and your participation in the study is important as it helps us to assess the risk of cesarean delivery following labor induction using a web based calculator. Your participation in the study is voluntary. If you decide to participate you are free to withdraw at anytime. All pregnant women meeting the inclusion criteria will be recruited in our study.

Procedure Involved:

If you agree to enroll yourself in my study, you will be interviewed regarding your present, past and family history, then you will be clinically examined in detail and investigated which may or may not cause pain. The procedures don't cause any temporary or lasting problems to you. Your cooperation is necessary as the procedure may be repeated a number of times as required.

Risks and Benefits:

There will be no potential risks and discomforts associated with any procedure involved in our study. The benefit of taking part in this research is your participation being valuable contribution to medical research to improvise treatment currently practiced.

Voluntary Participation/Withdrawal:

Your participation in this study is voluntary. You can withdraw from this study atanytime.

Privacy and Confidentiality:

The only people to know that you are a research subject are members of the research team. No information about you or information provided by you during the research will be disclosed to other without your written permission except:

- In emergency to protect your rights and welfare.
- If required by law.

Institutional/Sponsor's policy:

In the event of any injury related to study, treatment will be made available through KAHER- DR. PRABHAKER KORE CHARITABLE HOSPITAL attached to J.N. Medical College, Belagavi. There is no compensation or payment for such medical treatment by law. If your injured you may contact DR. T. SRIVANI, Post graduate student, Department of Obstetrics and Gynecology.

Financial incentives for participation:

No financial incentives are offered to enrolled patients. It is purely being done with the idea of research and all the cost of the study will be borne by the investigator. You will not be reimbursed for any expenses for the participation in this research.

Authorization to Publish Results:

When the results of the research are published or discussed, in a conference, no information will be displayed that would disclose your identity. Any information that is obtained in connection with this study and that can be identified with you will remain confidential.

CONSENT STATEMENT

I, _____ voluntarily agree for the participation as a subject of study. By signing this consent formI am not giving up any of my legal rights, I may withdraw from the study anytime. I am signing the consent form after having read or been read form in vernacular language, including the risks and the benefits and having all my questions answered.

Subject Name: _____

Signature or the Left Thumb Print of Subject: _____

Witness Name: _____ Signature: _____

Investigators Name: _____ Signature: _____

Date: _____

Place: _____

Principle Investigator:

REG NO: BJ0119019
Post Graduate Student,
Department of Obstetrics and Gynecology,
J. N. Medical College - KAHER
Belagavi.

Guide:

DR. _____.

Department OF Obstetrics and Gynecology,
J. N. Medical College – KAHER
Belagavi.

ANNEXURE III - SCREENING FORM.

- **SCREENING FORM**

  - Screening | | | | | | number:
  - Date of screening: _____
  - First name: _____
  - Middle name: _____
  - Last name: _____
  - Husband's name: _____
  - Age (years): _____
  - IP number: _____
  - Address: H.no-_____
  - Phone number-_____

Registered	
Unregistered	

- Screening criteria:

Included:	
Excluded:	

ANNEXURE IV– PROFORMA

- **CURRENT PREGNANCY:**

- **HISTORY:**

Patient came with chief complaint of:

ANTENATAL RISK FACTOR:	

- **OBSTETRIC HISTORY:**

- MARRIED LIFE:
- SCORE:

- **MENSTRUAL HISTORY:**

LMP	
EDD	
C.EDD	
POG	

PAST HISTORY:

- **GENERAL PHYSICAL EXAMINATION:**

HEIGHT	
WEIGHT	
BMI	

- **SYSTEMIC EXAMINATION:**

UTERINE HEIGHT	
PRESENTATION	
UTERINE ACTIVITY	
FHR	
EFW	

- INDICATIONS FOR LABOUR INDUCTION:

o Post-datisim

o FGR.

o PROM

o Oligohydramnios

o Foetal macrosomia

o Polyhydramnios

o Rh negative pregnancy

o Decreased foetal movements.

o PIH.

o GDM.

o Others.

- **PRE-INDUCTION ASSESSEMENT:**

TIME									
DILATATION OF CERVIX									
LENGTH OF CERVIX									
STATION									
CONSISTENCY									
POSITION									
TOTAL SCORE									
UTERINE CONTRACTIONS									
FHR									

- Pre – Induction Bishop score:

- MODE OF LABOUR INDUCTION:
  - Dinoprostone gel. ☐
  - Misoprostol ☐

Gestational age at labour:	
Indication of induction:	
Mode of labour induction:	
Mode of delivery: vaginal/operative vaginal/c-section:	
If C-section – Indication.	
Duration of labour: First stage of labour. Second stage of labour.	

- INDICATIONS FOR CESAREAN SECTION:

o Failed induction

o Foetal distress

o Non progress of labour

o Meconium stained liquor

o Others

➢ **MATERNAL OUTCOMES:**

o No complication

o Uterine hyperstimulation

o Tachysystole

o Uterine rupture

o Caesarean section

o Operative vaginal delivery

o Perineal tears.

- Shock
- PPH

➢ **NEONATAL OUTCOMES:**

- No complications
- Respiratory support (intubation, CPAP, HFNC)
- Birth asphyxia
- Resuscitation
- Seizures
- Sepsis
- Pneumonia
- Meconium aspiration syndrome
- Birth trauma
- Intracranial haemorrhage/Subgaleal haemorrhage
- Cephalohematoma
- Shoulder dystocia
- Hypoglycaemia
- NICU admission.
- Transient tachypnea of newborn

ANNEXURE VI - KEY TO MASTER CHART.

- Parity

  1- Primiparous.

  2- Multiparous.

- Category

  1- <18.9kg/m^2

  2- 19 – 24.9kg/m^2

  3- 25 – 29.9kg/m^2

  4- 30kg/m^2

- Indications for Induction :

  1- Post – datisim.

  2- FGR.

  3- PROM.

  4- Oligohydraminos.

  5- Fetal macrosomia.

  6- Polyhydraminos.

  7- Rh negative pregnancy

  8- Decreased foetal movements.

  9- PIH.

  10- GDM.

  11- Others.

- Indications for Caesarean :

  1- Failed Induction.

  2- Foetal distress.

  3- Labour dystocia.

  4- Meconium stained liquor.

5- Others.

- Mode of delivery :

1- Vaginal delivery.

2- Operative vaginal delivery.

3- Caesarean delivery.

- Maternal complications :

1- No complication.

2- Uterine hyperstimulation.

3- Tachysystole.

4- Uterine rupture.

5- Caesarean section.

6- Operative vaginal delivery.

7- Perineal tears.

8- Shock.

9- PPH

- Neonatal complications :

1- Yes.

2- No.

- Neonate sex :

1- Female.

2- Male.

S.NO:	AGE:	PARITY	POG:	HEIGHT:	WEIGHT:	BMI:	CATEGORY:	INDICATION:	C-SECTION INDICATION:	CALCULATED MODIFIED BISHOP SCORE:	CESAREAN DELIVERY RISK:	MODE OF DELIVERY:	MATERNAL OUTCOME:	NEONATAL OUTCOME:	SEX:	BIRTH WEIGHT:
Jan-00	20	1	39.57	150	57	25.3	3	7	1	0	49.9	3	5	1	1	2.8
2	32	1	38.14	148	59	29.5	3	8	1	2	40.2	3	5	1	2	2.9
3	25	1	37.28	155	63	26.2	3	10	1	1	45	3	5	1	1	3
4	21	1	39.28	157	77	31.3	4	9	1	1	55.2	3	5	1	1	2.7
5	26	1	37.57	152	66	28.5	3	9	1	0	49.9	3	5	1	2	3
6	36	1	37	158	83	33.3	4	9	1	0	60	3	5	1	2	3.1
7	22	1	39.57	146	57	26.7	3	10	1	2	40.2	3	5	1	2	2.6
8	30	1	40.14	156	74	30.4	4	1	1	2	46.3	3	5	1	1	2.8
9	27	1	39.42	148	54	24.6	2	3	0	4	23.2	2	6	1	1	2.7
10	22	1	39	147	55	25.4	3	2	0	4	31.2	1	1	1	2	2.4
11	23	2	37.28	146	55	25.8	3	4	0	2	15.1	1	1	2	2	2.2
12	25	1	39.85	148	58	26.4	3	4	1	2	40.2	3	5	1	1	2.8
13	20	1	37.14	150	52	23.1	2	2	1	0	39.8	3	5	2	2	2
14	23	1	37.28	145	64	30.4	4	10	1	0	60	3	5	1	2	2.8
15-Jan-00	23	1	39.42	157	62	25.2	3	4	0	0	49.9	1	1	1	1	2.8
16	23	1	39	152	57	24.6	2	2	2	0	39.8	3	5	2	2	1.8
17	26	2	39.28	158	68	27.3	3	4	0	3	15.8	1	1	1	2	2.7
18	25	1	41	155	58	23.3	2	1	4	1	41	3	5	1	2	2.8
19	23	2	40.14	158	60	24	2	1,8	0	2	13.2	1	1	1	2	2.6
20	25	2	40.28	149	55	24.9	2	1,9	0	2	13.2	1	1	1	1	3
21	29	1	38.28	157	73	29.6	3	4	1	0	49.9	3	5	1	1	2.6
22	22	1	39.28	150	65	28.8	3	4	2	0	49.9	3	5	1	2	2.7
23	24	1	39.45	158	58	23.2	2	4	2	0	39.8	3	5	1	1	2.8
24	30	1	38.57	150	58	25.7	3	9	5	0	49.9	3	5	1	2	2.7
25	20	1	40	150	56	24.8	2	1,4	0	2	36.4	1	1	1	1	3

26	20	1	37.71	152	56	24.2	2	3	5	1	35.2	3	5	1	1	3.2
27	24	2	40.42	158	58	23.2	2	1	3	2	13.2	3	5	1	1	3
28	20	1	41.28	156	60	24.6	2	1	4	0	49.9	3	5	1	1	3.5
29	22	1	37.85	158	62	24.8	2	7	2	0	39.8	3	5	1	1	3.5
30	24	2	40.28	160	60	23.4	2	1,9	0	3	8.3	1	1	1	1	2.5
31	20	1	38.14	158	58	23.2	2	2	0	2	30.9	1	1	1	1	2
32	23	1	39.71	160	60	23.4	2	8	0	4	17.9	1	1	1	2	3.1
33	24	1	39.71	154	56	23.6	2	5	3	0	39.8	3	5	1	2	3
34	28	1	41.57	152	60	25.9	3	1	5	1	51	3	5	1	1	3.5
35	20	1	40.57	158	62	24.8	2	1	4	2	36.4	3	5	1	1	3.5
36	27	1	37	150	54	24	2	9	0	0	39.8	1	1	1	1	2.5
37	24	2	40.14	156	59	24.2	2	1,9	0	4	29.3	1	1	1	1	3.1
38	24	1	40.42	156	56	23	2	3	5	4	27.9	3	5	1	2	2.8
39	23	1	38.14	153	56	23.9	2	2	0	0	39.8	1	1	1	2	1.9
40	21	1	40.71	158	60	24	2	1	1	0	45.9	3	5	1	1	2.9
41	22	2	38.14	154	56	23.6	2	7	0	2	10.6	1	1	1	1	2.8
42	30	2	39.71	160	60	23.4	2	3	0	4	5.5	1	1	1	1	2.7
43	27	1	39.14	156	60	24.6	2	3	1	1	35.2	3	5	1	1	3.1
44	25	2	40.57	155	58	23.3	2	1	0	4	9.3	1	1	1	1	3.1
45	23	1	39.57	160	66	25.7	3	8	1	0	41.9	3	5	1	2	2.5
46	25	1	38.14	156	58	23.8	2	3	0	4	23.2	1	1	1	2	3
47	23	1	37	158	60	24	2	9	5	0	39.8	3	5	1	1	2.9
48	23	2	40.14	155	58	23.3	2	1	0	4	9.3	1	1	1	2	2.6
49	20	1	38.42	160	58	22.6	2	5	5	0	32.4	3	5	1	1	3.4
50	29	1	37.85	156	66	27.1	3	5	1	0	41.9	3	5	1	1	3.1
51	24	2	38	158	60	24	2	9	0	3	8.9	1	1	1	1	2.8
52	27	2	37.14	160	62	24.2	2	2	0	2	7.9	1	1	1	1	2.2
53	26	1	40.14	158	64	25.7	3	3	1	2	46.3	3	5	1	1	3.9
54	24	1	38	160	66	26.5	3	4	1	0	49.9	3	5	1	2	3.23

55	20	1	38.71	158	62	24.8	2	8	2	3	26.8	3	5	1	1	3.2
56	21	1	40.28	158	64	25.7	3	1,4	0	4	36.8	1	1	1	2	3.2
57	25	2	40.28	158	60	24	2	1,4	0	4	9.3	1	1	1	2	2.7
58	23	1	39.42	156	63	25.9	3	3	1	1	45	3	5	1	2	2.7
59	20	1	40.85	160	60	24.3	2	1	0	3	25.4	1	1	1	2	3.1
60	21	1	40.85	158	64	25.7	3	1	4	3	41.4	3	5	1	1	3.8
61	25	1	40.14	158	60	24	2	1,4	2	2	36.4	3	5	1	2	2.8
62	26	2	41	156	66	27.1	3	1	0	3	15.8	1	1	1	2	3
63	24	1	41	154	64	27.3	3	1	1	2	46.3	3	5	1	1	2.8
64	24	2	37.85	154	52	22.6	2	10	0	1	12.6	1	1	1	2	2.8
65	30	1	37.14	148	62	28.3	3	9	1	1	45	3	5	1	1	3
66	21	1	38.57	148	56	25.5	3	9	4	1	45	3	5	1	1	2.7
67	24	1	39.14	152	54	23.4	2	9	0	4	23.2	1	1	1	1	2.8
68	21	1	40.57	162	60	22.9	2	1	4	1	33.5	3	5	1	1	2.7
69	30	1	38.57	156	56	24.3	2	4	4	1	35.2	3	5	1	1	2.7
70	22	1	38	152	64	27.7	3	9	2	0	49.9	3	5	1	2	3
71	24	2	40.85	160	59	23	2	1	0	3	11.1	2	6	1	2	2.6
72	26	1	37	156	67	27.5	3	3	0	3	41.4	2	6	1	1	2.8
73	23	1	41.71	147	60	21.7	2	3	2	4	27.9	3	5	1	1	2.7
74	24	1	37	152	62	27.5	3	9	2	2	40.2	3	5	1	2	2.9
75	24	1	40.71	153	63	26.9	3	1	0	3	46.3	1	1	1	1	3
76	27	1	40.57	154	62	26	3	1	2	3	41.4	3	5	1	1	2.7
77	23	1	37	154	64	27.8	3	9	1	2	40.2	3	5	1	2	2.7
78	23	1	40.28	150	64	29.2	3	8	1	2	46.3	3	5	1	1	2.9
79	20	1	38.14	152	56	24.2	2	5	2	0	39.8	3	5	1	1	3
80	21	1	38	154	58	24.4	2	8	0	2	30.9	1	1	1	1	2.2
81	35	1	40	148	58	27.6	3	1,5	1	0	56	3	5	1	1	4
82	29	1	40	150	56	25.4	3	1,9	0	4	36.8	1	1	1	2	2.5
83	24	2	40.57	154	56	23.6	2	1	0	3	11.1	1	1	1	2	2.9

84	26	2	39.14	156	58	23.8	2	3	0	4	7.4	1	1	1	1	3.4
85	24	2	38.42	156	60	24.6	2	2	0	1	12.6	1	1	2	1	2.7
86	26	1	39.71	147	57	27.1	3	3	5	2	40.2	3	5	1	1	3.7
87	24	2	37.85	156	62	25.5	3	3	0	4	10.8	1	1	1	2	2.4
88	26	2	38.28	154	58	24.5	2	3	0	3	8.9	1	1	1	1	3.2
89	22	1	38.28	156	56	23	2	8	0	3	26.8	1	1	1	1	2.4
90	23	1	40.71	154	63	26.5	3	1	0	4	36.8	1	1	1	1	2.8
91	20	1	40.42	158	62	24.8	2	1,9	0	4	27.9	1	1	1	1	3
92	26	2	37.14	154	58	24.5	2	9	0	3	8.9	1	1	1	1	2.8
93	24	1	40.28	154	58	24.5	2	3	2	3	41.4	3	5	1	1	2.7
94	22	1	37.85	153	56	23.9	2	3	0	4	23.2	1	1	1	1	2.6
95	28	2	41	154	56	23.6	2	1	0	4	9.3	1	1	1	2	2.4
96	23	1	38.28	150	58	25.7	3	3	5	3	35.6	3	5	1	1	3.2
97	21	1	40.57	150	56	24.8	2	3	0	4	27.9	1	1	1	2	2.7
98	20	1	40	152	57	24.6	2	3	0	4	27.9	2	6	1	1	2.8
99	31	1	39.14	162	60	22.9	2	9	0	1	28.3	2	6	1	1	2.6
100	25	2	37.57	158	64	25.7	3	3	0	4	35.6	1	1	1	1	1.9
101	24	1	40	160	60	23.4	2	9	3	0	38	3	5	1	2	2.9
102	22	1	40.28	162	64	24.4	2	1,4	3	1	33.5	3	5	1	2	2.8
103	21	1	37.28	158	58	23.2	2	3	2	3	26.8	3	5	1	2	2.6
104	23	1	40.57	159	58	23	2	1	2	2	29.3	3	5	1	2	3.1
105	23	2	38.14	156	56	23	2	3	0	4	7.4	1	1	1	1	2.7
106	26	1	39.28	162	58	22.1	2	3	3	0	32.4	3	5	1	2	2.75
107	35	2	37.85	158	59	23.6	2	11	0	3	8.9	1	1	1	1	2.6
108	20	1	39.85	157	63	25.6	3	1	4	0	49.9	3	5	1	2	2.9
109	26	1	39.85	162	64	24.4	2	10	5	1	28.3	3	5	1	2	2.9
110	22	1	40	158	57	22.8	2	1	0	3	36.4	1	1	1	1	3.1
111	23	1	39.71	157	60	24.3	2	4	2	0	39.8	3	5	1	2	2.9
112	23	1	41.57	158	60	24	2	1	0	2	30.9	1	1	1	2	2.8

113	23	1	41.14	156	58	23.8	2	1	4	2	36.4	3	5	1	2	2.5
114	29	1	40	160	58	22.6	2	1,8	0	1	33.5	1	1	1	2	2.9
115	23	1	40	158	57	22.4	2	3	2	2	36.4	3	5	1	2	2.5
116	30	2	37.57	156	58	23.8	2	3	0	4	7.4	1	1	1	1	3
117	21	1	40.71	160	60	23.4	2	1	0	3	25.4	1	1	1	2	3.3
118	25	1	40.85	158	64	25.7	3	1	5	1	51.1	3	5	1	1	3.3
119	24	1	40.42	157	63	25.6	3	3	5	3	41.4	3	5	1	1	3
120	24	1	38.14	158	60	24	2	3	0	4	23.2	1	1	1	1	2.9
121	26	1	41	160	58	23.4	2	1	0	3	25.4	1	1	1	1	4
122	24	1	39	158	60	24	2	3	0	4	23.2	1	1	1	1	2.8
123	25	2	38.85	157	60	24.3	2	3	0	3	8.9	1	1	1	1	3.4
124	24	2	41.14	158	58	23.4	2	1	2	2	13.2	3	5	1	1	3.4
125	23	1	38.57	156	58	23.8	2	3	0	4	23.2	1	1	1	2	2.8
126	23	1	40.28	162	64	24.4	2	1,4	2	2	29.3	3	5	1	2	2.4
127	25	1	40.28	160	58	23.4	2	3	0	3	25.4	1	1	1	1	3
128	25	2	37.57	156	60	24.6	2	3	0	4	3.8	1	1	1	2	2.4
129	24	1	37.71	158	64	25.7	3	3	5	1	37.2	3	5	1	1	2.8
130	22	1	38.14	160	62	24.2	2	3	2	2	7.9	3	5	2	1	2
131	31	2	41.14	160	62	24.2	2	1	0	3	11.1	1	1	1	2	3.5
132	24	1	40.57	158	60	24	2	1	0	2	36.4	1	1	1	2	2.9
133	21	1	40.14	160	60	23.4	2	1,5	0	2	36.4	1	1	1	2	4
134	23	1	40.85	160	62	24.2	2	1	4	0	45.9	3	5	1	1	2.5
135	23	1	38	158	60	24.9	2	3	0	4	23.2	1	1	1	1	3.1
136	24	1	39.14	160	60	23.4	2	3	0	4	23.2	1	1	1	2	2.8
137	26	1	38.71	158	60	24	2	2	0	1	35.2	1	1	1	2	2.5
138	24	1	41	158	60	24	2	1	4	0	45.9	3	5	1	1	2.9
139	20	1	40.14	158	64	24	2	1	0	2	36.4	1	1	1	2	2.6
140	20	1	41.28	152	64	27.7	3	1	4	2	46.3	3	5	1	1	2.5
141	30	2	40.85	160	62	27.7	3	1	4	3	15.8	3	1	1	2	3.1

142	25	1	38.85	160	60	23.4	2	3	0	3	26.8	2	6	1	2	2.5
143	21	1	37.57	160	58	22	2	9	0	3	26.8	1	1	1	2	2.4
144	20	1	40..57	160	58	22	2	1,7	0	2	36.4	1	1	2	1	2
145	27	2	37.71	160	58	22.6	2	9	0	3	8.9	1	1	2	2	2
146	24	2	40.42	160	62	24.2	2	1,3	2	3	11.1	3	5	1	2	2.6
147	27	1	37.57	158	60	24	2	3	3	3	26.8	3	5	1	1	2.8
148	25	1	37.57	160	58	22.7	2	11	0	4	23.2	1	1	1	1	2.9
149	25	1	39.71	158	60	24	2	11	4	2	30.9	3	5	1	1	2.8
150	32	1	40..85	160	62	24.2	2	1,9	4	0	45.9	3	5	1	2	2.8
151	24	1	37	160	62	24.2	2	2	0	0	39.8	1	1	2	2	1.9
152	28	1	37.57	158	60	24	2	2	0	0	39.8	1	1	2	1	2.2
153	32	1	40.28	160	58	22.7	2	1,4	4	0	45.9	3	5	1	2	3.1
154	23	1	39.85	158	60	24	2	2	0	3	26.8	1	1	2	2	2.2
155	27	2	38.14	158	62	24.8	2	7	1	0	14.9	3	5	1	1	2.6
156	24	1	38.14	160	62	24.2	2	11	1	2	30.9	3	5	1	1	2.5
157	23	1	37	158	62	24.8	2	3	0	3	26.8	1	1	1	2	2.5
158	24	1	41.14	160	62	24.2	2	1	4	0	45.9	3	5	1	2	2.9
159	21	1	37.42	158	60	24	2	4	0	1	35.2	1	1	1	2	2.9
160	28	2	40.14	158	60	24	2	1,4	0	3	11.1	1	1	1	2	2.9
161	24	1	39.42	158	60	24	2	3	2	3	26.8	3	5	1	2	2
162	24	2	40.14	160	62	24.2	2	1,4	0	3	11.1	1	1	1	2	3
163	26	2	39.28	158	60	24	2	8	0	3	8.9	1	1	1	1	2.7
164	20	1	38.28	154	60	25.3	3	8	1	2	40.2	3	5	1	1	3.4
165	22	1	40.57	152	48	20.7	2	1,4	2	2	36.4	3	5	2	1	2.4
166	24	1	38.42	156	48	19.7	2	2	0	0	39.8	1	1	2	1	2.3
167	24	1	40.28	158	66	26.5	3	1,4	2	4	36.8	3	5	1	1	3
168	25	1	39.28	158	62	24.8	2	8	2	0	39.8	3	5	1	1	2.9
169	24	1	39.57	154	60	25.3	3	3	1	2	40.2	3	5	1	1	3.1
170	22	1	41.85	156	64	26.3	3	1	2	2	30.9	3	5	1	2	2.8

171	20	1	39.42	145	50	23.8	2	7	2	0	39.8	3	5	1	2	2.5
172	22	2	38.57	156	58	24.7	2	5	2	0	14.9	3	5	2	1	3.1
173	27	1	40.57	154	61	25.7	2	1	3	0	56	3	5	1	2	3
174	32	2	40	158	64	25.7	3	1,4	2	2	18.6	3	5	1	1	2.8
175	27	1	41.42	144	54	25.5	3	1	2	0	56	3	5	1	1	2.9
176	20	1	37	150	50	21.6	2	3	0	4	23.2	1	1	1	1	2.7
177	20	1	40.42	158	69	27.7	3	1,4	0	3	41.4	1	1	1	2	3.5
178	27	2	37	160	70	27	3	5	3	0	20.9	3	5,9	1	1	3.1
179	25	2	40.42	160	58	22.6	2	1,9	0	0	18.4	1	1	1	1	3.4
180	21	1	39	158	58	23.2	2	2	0	2	30.9	1	9	1	2	2.5
181	20	1	39.71	156	68	27.9	3	9	4	0	49.9	3	5	1	2	2.6
182	29	1	40.85	160	70	27.3	3	1	0	0	56	1	1	1	1	3.1
183	23	2	37.71	156	58	23.8	2	2	4	2	10.6	3	5	2	1	2.4
184	32	2	38	156	58	23.8	2	2	2	2	10.6	3	5	2	1	1.5
185	20	1	40.42	162	60	22.9	2	1,4	0	3	32	1	7	1	2	2.7
186	22	1	40.71	153	64	27.3	3	1,9	4	4	36.8	3	5	1	1	2.8
187	35	2	37.57	156	52	21.3	2	2	4	2	10.6	3	5	2	2	2
188	27	1	40	154	67	28.2	3	1,9	2	3	41.4	3	5	1	2	2.6
189	26	2	37.42	152	52	22.5	2	3	0	3	8.9	1	1	1	1	3
190	35	1	37	158	54	21.6	2	3	2	2	30.9	3	5	1	2	2.5
191	22	1	40.71	152	52	22.5	2	1,9	0	2	36.4	1	9	1	1	3.5
192	30	2	40.42	148	56	26.6	3	1,4	0	3	15.8	1	9	1	1	3.2
193	27	2	40	155	54	22.5	2	1,4	0	3	11.1	1	1	1	2	2.6
194	26	1	40.42	153	72	30.7	4	1,7	2	0	46.6	3	5	2	1	2.4
195	28	1	41	155	75	31	4	1	2	0	65.7	3	5,9	1	2	3.4
196	26	2	37.28	156	66	27.1	3	3	3	2	15.1	3	5	2	2	2.3
197	20	1	38.57	157	62	25.2	3	9	2	3	35.6	3	5	1	1	2.6
198	22	1	40.14	154	60	25.3	3	1,9	0	0	56	1	1	1	2	2.9
199	25	1	38.85	154	46	19.4	2	3	0	2	30.9	1	1	1	2	2.5

200	26	1	38.42	155	72	30	4	3	2	3	45.4	3	5	1	1	2.7
201	27	1	40.14	152	56	24.2	2	1	0	3	32	1	1	1	2	2.7
202	30	1	38.14	156	58	23.8	2	9	3	0	39.8	3	5	1	1	3
203	32	1	40.57	158	62	24.8	2	11	4	0	45.9	3	5	1	1	2.5
204	26	1	39.14	152	73	32	4	7	1	0	60	3	5	1	2	2.5
205	20	1	37.14	150	70	30.4	4	2	2	0	60	3	5	2	1	1.3
206	32	2	37.14	150	56	24.8	2	2	0	0	14.9	1	1	2	2	2
207	38	2	40.57	146	60	27	3	1	0	2	18.6	1	9	1	2	2.7
26-Jul	26	2	39.42	152	66	28.5	3	9	4	3	12.8	3	5	1	2	3.3
27-Jul	28	1	38.28	156	62	25.5	3	9	4	0	49.9	3	5	1	2	2.5
210	34	1	39.42	153	64	27.3	3	8	4	0	20.9	3	5	1	1	3.3
211	26	2	38.71	152	58	25.1	3	8	0	3	12.8	1	1	1	1	3.4
212	30	1	39.42	150	58	25.7	3	10	2	0	49.9	3	5	1	2	3
213	22	1	38.57	162	63	24.3	2	9	0	0	32.4	1	1	1	2	2.6
214	23	1	37.85	152	66	28.9	3	5	5	0	49.9	3	5	1	1	4
215	19	1	38.57	150	60	26.6	3	10	0	3	35.6	2	6	1	1	2.8
216	22	1	39	152	66	28.9	3	2	2	2	40.2	3	5	1	2	3.1
217	23	1	38.85	149	50	22.5	2	8	4	0	39.8	3	5	1	1	3
218	35	2	37.85	162	65	24.8	2	9	5	3	6.6	3	5	1	2	2.6
219	26	2	41	160	82	32	4	1	0	0	33.7	1	1	1	2	3.4
220	24	1	39.57	156	58	23.8	2	9	5	3	26.8	3	5	1	2	3.5
221	20	1	40.85	150	56	24.8	2	1	0	2	36.4	1	1	1	2	2.6
222	25	1	38.71	156	70	28.8	3	9	0	3	35.6	2	6	2	1	2.7
223	20	1	41.71	158	64	25.7	3	1	5	2	46.3	3	5,9	1	1	3.8
224	23	1	40.71	152	62	26.8	3	1,4	0	4	36.8	1	1	1	1	2.5
225	29	2	39.71	156	58	23.8	2	4	2	2	10.6	3	5	1	2	3
226	20	1	41	152	62	26.8	3	1	2	0	56	3	5	2	1	2.4
227	26	1	40.14	154	66	27.8	3	1,9	5	3	41.4	3	5	1	2	3
228	22	1	40.85	158	60	24	2	1	0	4	27.9	1	1	2	2	2.7

229	25	1	38	158	64	25.7	3	9	4	0	39.8	3	5	1	1	3.2
230	24	1	39.71	153	65	25.6	3	9	0	2	40.2	1	1	1	1	2.8
231	26	1	40.57	154	64	27	3	1,9	0	3	41.4	1	1	1	2	2.5
232	21	1	40.14	150	62	27.5	3	1	0	4	36.8	1	1	1	1	3.4
233	27	1	37.42	158	78	31.3	4	5	4	3	45.4	3	5	1	2	3.2
234	26	1	38.14	148	72	32.8	4	2	0	2	50.3	1	1	2	2	2.2
235	27	1	39.14	147	60	27.7	3	8	2	3	35.6	3	5	1	2	2.8
236	22	1	40	156	58	23.8	2	1	2	0	45.9	3	5	1	2	2.9
237	25	2	37	150	50	22.2	2	2	0	0	14.9	1	1	2	2	1.8
238	26	1	40.28	151	67	29.3	3	1,4	3	0	56	3	5	1	1	2.9
239	27	1	40.14	156	58	24.1	2	1,4	2	3	32	3	5	1	1	2.6
240	26	1	38.28	158	62	24.8	2	9	2	2	30.9	3	5	1	1	3.1
241	22	1	39.57	156	58	23.8	2	11	0	4	23.2	1	1	1	2	3
242	30	2	38.57	155	71	29.5	3	4	0	2	15.1	1	1	1	2	2.8
243	24	1	40	154	74	31.2	4	1	0	1	51.1	2	6	1	2	3
244	21	1	38	150	48	21.3	2	2	4	0	39.8	3	5	2	1	2.1
245	25	2	39.85	153	66	28.2	3	9	2	2	15.1	3	5	1	1	3.2
246	22	1	40.42	158	60	24	2	1,4	5	2	36.4	3	5	1	1	3.9
247	23	1	38.57	152	62	26.8	3	8	2	2	49.9	3	5	1	1	3.4
248	20	1	38.28	156	58	23.8	2	2	2	0	39.8	3	5	2	1	2.1
249	22	1	38	154	61	25.7	3	9	2	0	49.9	3	5	1	1	2.7
250	21	1	40	152	68	29.4	3	1,8	2	2	46.3	3	5	1	2	2.9
251	22	1	40.14	152	64	28	3	8	4	2	41.4	3	5	2	1	3
252	28	1	38.14	152	58	25.4	3	4	2	0	49.4	3	5	2	2	2.2
253	20	1	38.71	156	62	25.5	3	2	0	0	40.2	2	6	1	1	2.6
254	28	1	38.57	156	62	25.5	3	3	2	0	49.9	3	5	2	2	2.3
255	23	1	39.42	156	69	28.3	3	8	3	0	49.9	3	5	1	1	2.8
256	27	1	40.85	158	65	26.1	3	1,8	2	3	41.4	3	5	1	1	2.7
257	31	2	37.85	156	60	24.6	2	4	0	3	26.8	1	1	1	1	2.8

258	36	2	37.85	158	67	26.9	3	10	2	2	40.2	3	5	1	1	3
259	21	2	38.57	156	58	23.8	2	4	0	2	10.6	1	1	1	2	2.8
260	25	2	40	156	62	26.4	3	9	4	2	18.6	3	5	1	1	3.1
261	21	1	38.28	152	60	25.9	3	9	0	0	49.9	1	1	1	2	2.5
262	25	1	37.71	158	62	24.8	2	2	2	0	39.8	3	5,9	2	2	2.3
263	22	1	37	145	46	21.9	2	3	0	4	23.2	1	1	2	1	2.1
264	24	1	38.28	158	62	24.8	2	5	2	0	39.8	3	5	1	1	3.5
265	24	1	40.71	152	62	26.8	3	1,4	4	2	46.3	3	5	1	2	2.8
266	30	1	37.14	154	60	25.3	3	10	2	0	39.8	3	5	1	1	2.9
267	24	2	37	148	54	25.7	3	4	2	0	20.9	3	5	1	1	2.5
268	29	2	40.14	151	70	30.7	4	1	1	2	33.7	3	5	1	1	3.2
269	32	1	39.71	155	53	32	4	7	0	0	39.8	1	1	1	1	2.7
270	30	1	40	158	60	24	2	1	1	0	45.9	3	5	1	1	3
271	26	1	37.28	154	58	24.4	2	8	3	0	39.8	3	5	1	1	2.8
272	34	2	40.57	158	60	24	2	1,7	0	4	9.3	1	1	1	2	2.9
273	24	2	39.42	158	58	23.2	2	9	0	3	12.8	1	1	2	2	3
274	34	1	37.57	156	64	26.3	3	10	2	0	49.9	3	5	1	2	3.6
275	23	2	39.57	158	60	24	2	3	0	2	7.9	1	1	1	2	3.3
276	23	2	39.28	156	58	23.8	2	10	0	4	7.4	1	1	1	1	3
277	21	2	40.71	162	58	22.1	2	1,7	2	3	8.3	3	5	1	1	2.7
278	23	2	38.71	158	62	24.8	2	2	4	1	9.5	3	5	1	1	2.3
279	26	2	40.14	158	62	24.8	2	9	3	3	8.3	3	5	1	2	3.5
280	36	1	39	154	68	28.6	3	10	3	1	45	3	5	1	1	3
281	29	1	39	150	58	25.7	3	9	0	3	35.6	1	1	1	1	3.5
282	24	1	37	153	61	26	3	2	2	0	49.9	3	5	2	2	2.1
283	30	2	41.14	158	62	24.8	2	3	0	4	6.9	2	6	1	1	3.2
284	25	1	37	158	58	27.6	3	2	3	0	41.9	3	5	2	1	2
285	23	1	39.28	154	60	25.3	3	8,10	5	3	35.6	3	5	1	2	3.6
286	20	1	37.71	152	60	25.9	3	8,10	1	2	40.2	3	5	1	1	3.4

287	29	1	40.71	158	79	31.7	4	1	2	0	58.2	3	5	1	2	3.5
288	21	1	40.57	153	62	26.4	3	3	0	4	36.8	1	1	1	1	2.8
289	23	1	37.71	153	65	27.7	3	2	4	0	49.9	3	5	1	2	2.2
290	22	1	40.57	154	72	30.3	4	1	4	0	65.7	3	5	1	2	2.9
291	29	1	40.71	160	69	26.9	3	1	0	2	38.4	1	1	1	1	3.2
292	28	1	37	152	64	27.7	3	9	0	4	31.2	1	1	1	1	2.7
293	24	1	40.85	154	74	31.2	4	1	5	0	56	3	5	1	2	3.2
294	23	1	39.28	153	52	22.2	2	2	0	3	26.8	1	1	1	1	2.4
295	30	1	37.42	154	61	25.7	3	4	1	0	49.9	3	5	1	2	2.8
296	22	1	41	154	66	27.8	3	1	4	0	56	3	5	1	1	3.5
297	21	1	40	154	54	22.7	2	1,9	0	4	27.9	2	6	1	1	3.5
298	20	1	40.85	156	62	25.5	3	1	4	3	41.4	3	5,9	1	1	2.8
299	20	1	37.57	153	57	24.6	2	9	1	0	39.8	3	5	1	2	3.3
300	20	1	41.28	150	51	23	2	1,2	2	0	45.9	3	5	1	2	2.2
301	22	1	40.28	152	57	24.6	2	1,3	5	2	36.4	3	5	1	2	2.8
302	24	1	38.14	156	62	25.5	3	3	5	3	35.6	3	5	2	2	2.3
303	24	1	41	156	62	25.5	3	1	4	1	51.1	3	5	1	2	3.8
304	21	1	40.42	156	58	23.8	2	1,9	4	0	45.9	3	5	1	2	3.2
305	26	1	40.28	154	62	26.1	3	1.9	4	0	56	3	5	1	2	3.2
306	25	1	39.14	160	58	22.6	2	10	4	1	28.3	3	5	1	2	3.6
307	23	1	39.57	152	54	23.3	2	10	0	4	23.2	1	1	1	2	3
308	38	2	41	152	66	28.5	3	1	0	4	13.4	1	1	1	2	2.6
309	31	2	39.42	160	56	21.8	2	9	0	4	5.5	1	1	1	1	2.5
310	19	1	37	152	58	25.1	2	2	0	1	45	1	1	2	2	2.2
311	24	1	40.28	158	56	22.4	2	1,7	0	4	21.9	1	1	1	1	2.6
312	21	1	37	156	64	26.3	3	10,5	1	0	49.9	3	5	1	1	2.9
313	30	2	38	158	62	24.8	2	9	0	3	6.6	1	1	1	2	3
314	22	1	37.57	152	50	21.6	2	2	1	0	39.8	3	5	1	1	2.5
315	24	2	38.28	158	60	24	2	2	0	3	6.6	1	1	2	1	2

316	21	1	40.14	154	61	25.7	3	1,8	0	3	41.4	1	1	1	1	2.8
317	26	2	37.57	152	57	24.6	2	9	0	3	8.9	2	6	1	1	3.5
318	20	1	37.71	156	58	23.9	2	2	2	1	35.2	3	5	2	1	1.9
319	23	1	41.14	152	60	25.9	3	1	4	1	51.1	3	5	1	1	3.3
320	24	1	38.28	156	62	25.5	3	10	3	1	45	3	5	1	1	3.1
321	22	1	38.71	160	58	22.6	2	3	0	3	21	1	1	1	1	2.9
322	27	2	37.14	152	60	25.9	3	3	0	3	12.8	1	1	1	1	2.9
323	26	1	41	152	66	28.5	3	1	1	2	46.3	3	5	1	2	2.2
324	22	2	40.14	152	58	25.1	3	1,9	0	3	15.8	1	1	1	2	2.8
325	30	2	41	158	56	22.4	2	1	0	3	8.3	1	1	1	2	3
326	22	1	40.57	156	58	23.9	2	3	0	3	32	1	1	1	2	2.9
327	21	1	41	154	61	25.7	3	1	4	1	51.7	3	5	1	2	3
328	26	1	39.85	152	58	25.1	3	3	0	3	35.6	1	1	1	1	2.5
329	28	2	40	152	60	25.9	3	1,3	0	3	15.8	1	1	1	1	2.9
330	24	1	38	152	58	25.1	3	4	0	3	35.6	1	1	1	2	3
331	21	1	38	152	54	23.3	2	3	0	4	23.2	1	1	1	1	2.7
332	21	1	40.85	160	56	21.8	2	1	5	1	33.5	3	5	1	1	3.3
333	22	1	38.14	158	56	22.4	2	2	2	0	32.4	3	5	1	1	2.4
334	23	2	41	152	58	25.1	2	1	0	3	15.8	1	1	1	2	3.5
335	25	1	40.71	158	56	22.4	2	1	4	1	33.5	3	5	1	1	3.8
336	22	1	37.85	154	61	25.7	3	2	2	1	45	3	5	1	2	2.8
337	22	1	38	156	58	23.8	2	3	0	3	26.8	1	1	1	2	2.9
338	24	1	40.14	152	66	28.5	3	1,8	2	1	51.1	3	5	1	1	2.8
339	22	1	41.14	152	60	21.6	2	1	0	4	27.9	1	1	1	2	2.9
340	25	1	39.28	152	58	25.1	3	10	5	0	49.9	3	5	1	1	2.8
341	22	1	38.14	156	58	23.9	2	10	2	0	39.8	3	5,9	1	2	2.1
342	24	2	38.71	152	54	23.3	2	10	0	3	8.9	1	1	1	2	3.4
343	24	1	37.42	152	54	23.3	2	7	0	3	26.8	1	1	2	2	2.3
344	24	1	37.42	156	58	23.9	2	2	0	2	30.9	1	1	2	2	2.2

345	23	1	40.57	158	60	24	2	1,10	4	0	38	3	5	1	1	3
346	27	2	38	152	54	23.3	2	10,8	2	3	8.9	3	5,9	1	2	3
347	28	2	41.28	156	58	23.8	2	1	0	3	11.1	1	1	1	1	3.2
348	26	2	40.28	158	56	22.4	2	1,8	0	3	8.3	1	1	1	1	2.8
349	24	1	37	156	64	26.3	3	9	2	0	49.9	3	5	1	1	2.5
350	22	1	37.71	152	66	28.5	3	2	1	0	49.9	3	5	1	2	2.5
351	24	1	37.42	160	56	21.8	2	2	5	1	28.3	3	5	1	2	2.5
352	26	2	40.57	154	61	25.7	3	1,8	0	3	15.8	1	1	1	1	2.9
353	25	2	37.14	152	60	25.9	3	10	0	3	12.8	1	1	1	1	3