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**Original Article**



# Is Usage of Safe Delivery and Surgical Kits for Intrapartum Services Reducing Infection Rates?

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## ABSTRACT

**Background**: Poor infection control practices during childbirth are recognized as a critical factor leading to maternal and neonatal morbidity and mortality. Therefore, this study intends to assess the effectiveness of safe delivery and surgical kits supplied by Government of Andhra Pradesh to ensure a safe birthing environment. This study shows impact of safe delivery and surgical kits supplied by the Government of Andhra Pradesh on maternal and neonatal morbidity and mortality. However, the current evidence is limited and further studies are required.

**Materials and Methods**: It was a retrospective observational study done at a tertiary care hospital attached to medical college admitting patients from all over the district. On an average, 3500 women deliver every year at our institute. This study is conducted on 200 Pregnant women with period of gestation above 37 weeks, giving normal vaginal birth at GGH SRIKAKULAM and Health personnel using safe delivery and surgical kits were included regardless of women's obstetric or medical complications, parity, education or socio-economic status.

**Study Period**: JULY 1ST 2021 TO AUGUST 31ST 2021

**Results**: This study proved that universal and uniform usage of safe sterile practices during intrapartum care by health care professionals reduced maternal post partum sepsis, duration of hospital stay and improved patients and health care person satisfaction scores. Similarly the neonatal sepsis rates and admission to NICU was also almost nil in those cases delivered using the safe delivery kits. Usage of safe delivery and surgical kits appears to be a promising strategy to achieve the country targets of SGD reducing maternal and neonatal morbidity and mortality.

**Conclusion**: All health care delivery points of intrapartum maternity care should practice safe birthing techniques and use the kits supplied to achieve zero sepsis for both mother and neonate.

**Key Words**: *Safe delivery and surgical kit, child birth, puerperal and neonatal infection, morbidity and mortality*

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## INTRODUCTION:

An estimated 3,03,000 women die during pregnancy, childbirth or within 42 days of termination of pregnancy or of giving birth each year and approximately 2.62 million babies die within 28 d of being born [1, 2]. Almost all of these deaths take place in low- and middle-income countries (LMICs) and most are preventable. In 2015, the United Nations General Assembly developed the Sustainable Development Goals (SDGs) to supersede the Millennium Development Goals [3, 4]. The SDGs are a set of universal goals that have been implemented to achieve economic growth, environmental protection and social progress. Outlined in 'Transforming our world: the 2030 Agenda for Sustainable Development', goal 3 was established to 'ensure healthy lives and promote well-being for all at all ages', and specifically includes targets for the improvement of maternal and newborn health, such as national targets of no more than 140 maternal deaths per 100 000 live births and no more than 12 newborn deaths per 1000 live births [5]. To achieve these targets in low-resource countries that have disproportionately and persistently high maternal mortality ratio and neonatal mortality rates, there is a critical need for appropriate low-cost, effective, evidence-based interventions at and around the time of childbirth.

Infection is a leading cause of maternal and newborn morbidity and mortality [6, 7]. Responsible for an estimated 10.7% of all maternal [8] and 44% of all newborn [9] deaths globally each year. In LMICs more than half of all deliveries take place at home, and on average 50% of mothers give birth without skilled birth attendants (SBAs) [10]. In these countries, neonatal infections are 3–20 times higher than those of facility-born neonates in high-income countries.

11 Poor hygiene during the intrapartum period is recognised as a critical factor leading to life-threatening maternal and newborn sepsis [11].

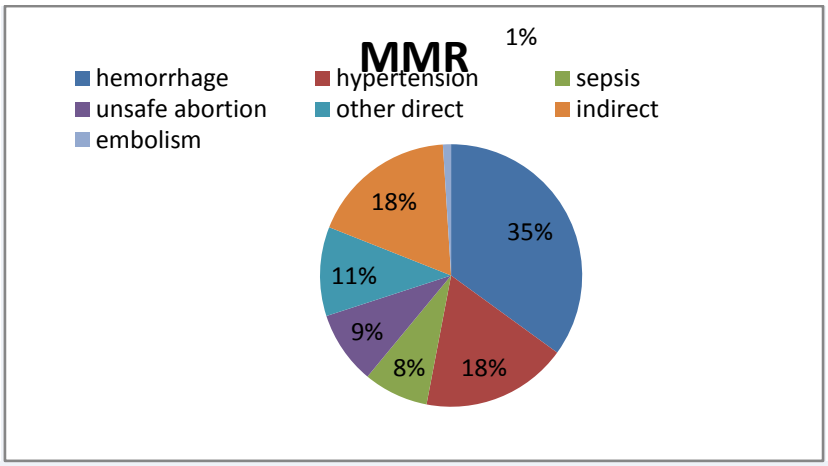



**FIGURE 1: This is a pie diagram showing various causes of maternal mortality.**

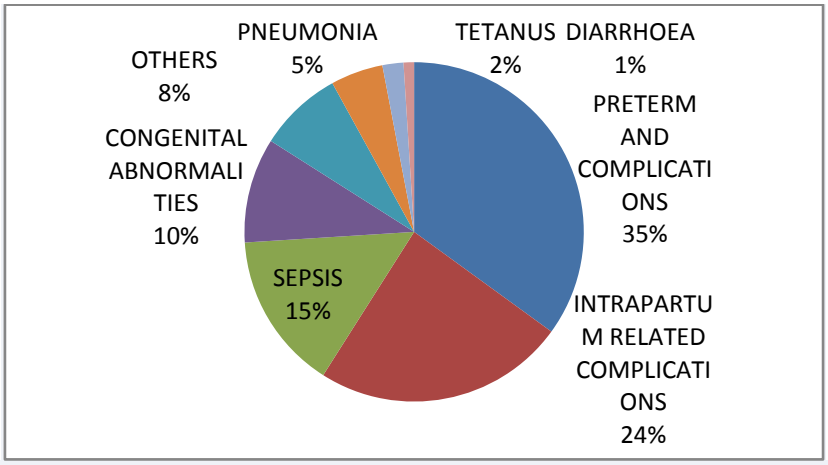



**FIGURE 2: This is a pie diagram showing various causes of neonatal mortality**

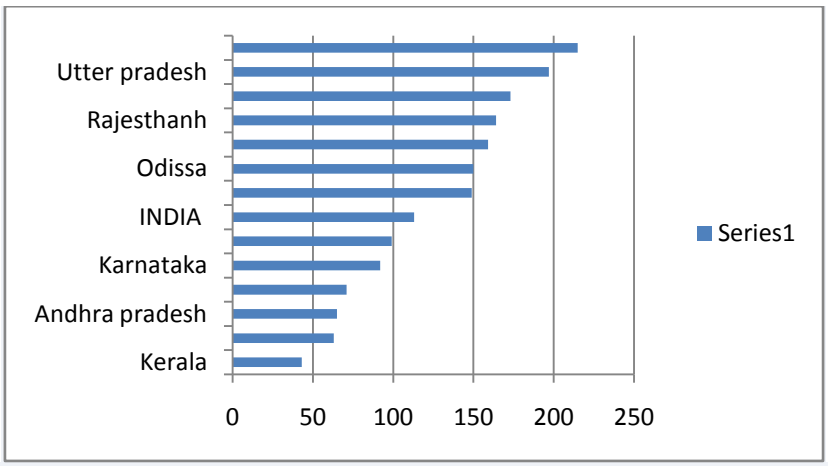



**FIGURE 3: Showing maternal mortality rate among various states in INDIA when compared to the national average**

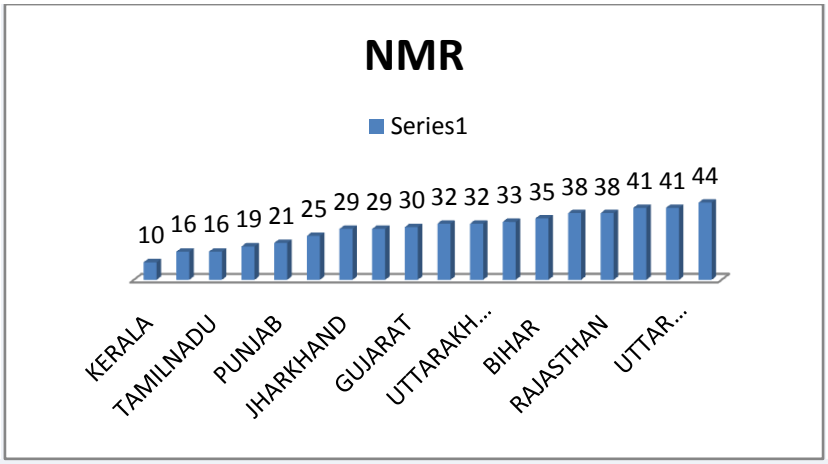



**FIGURE 4: Showing neonatal mortality rate among various states of INDIA when compared to the national average**

In1996, WHO released primary recommendations for a safe delivery; these outlined the essential principles of cleanliness, also known as the 'six cleans': clean hands of the birth attendant, clean perineum of the mother, nothing unclean to be introduced into the vagina, clean delivery surface, cleanliness in cutting the umbilical cord and cleanliness for cord care of the newborn baby [12, 13]. One approach endorsed by WHO and the United Nations to facilitate clean delivery practices in low-resource settings has been the provision of a clean birth kit [14]. Clean birth kits may also be referred to as birthing kits, birth kits, clean delivery kits, disposable delivery kits or mama kits and safe delivery and surgical kits.

To facilitate the six principles of cleanliness, WHO recommends that delivery kits contain at a minimum: soap, plastic sheet, razor blade, cord ties, spirit (alcohol swabs) and gauze [15, 16]. Government of INDIA took the initiative and introduced different national programmes to reduce both the maternal and neonatal mortality and morbidity like NATIONAL RURAL HEALTH MISSION In 2005, JANANI SURAKSHA YOJANA In 2005, JANANI SISHU SURAKSHAKARYAKRAMAM In2011, DAKSHATA In 2015, LAQSHYA In 2017. For this purpose Government of Andhra Pradesh designed safe delivery and surgical kitsdisposable pack/kit that is made up of items used in the intrapartum period during birth of the baby. A safe delivery and surgical Kit includes disposable surgical gloves, disposable mask, disposable plastic apron, disposable cap, disposable shoe cover, single edge razor blade, disposable sterile pad, umbilical clamp, perineal sheet, baby wrap towel, mucus extractor, sanitary napkins.

**STUDY DESIGN:**

The present study (200 pregnant women) was a retrospective observational study done at Government General Hospital (tertiary care hospital) attached to Government medical college, Srikakulam which is a semi urban medical college covering patients from all over the Srikakulam district. On average, 3500 women deliver every year at our institute.

**INCLUSION CRITERIA**: 1. Pregnant women with gestational age above 37 weeks gestation 2.women giving normal vaginal birth using a safe delivery and surgical Kit

**EXCLUSION CRITERIA**: 1.pregnant women having obstetric or medical complications2. pregnan women less than 37 weeks gestation 3.level of risk 4.education 5. socio-economic status.

**STUDY PERIOD:** JULY 1$^{ST}$ 2021 TO AUGUST 31$^{ST}$ 2021 (2 MONTHS)

**MATERIAL AND METHODS**

A total of 200 pregnant women were included in our study,who were above 37 weeks gestation and undergone normal vaginal delivery in our institute from 1$^{st}$july2021to august 31, 2021regardless ofwomen's obstetric or medical characteristics, level of risk, education or socio-economic status.Safe delivery and surgical kit contains disposable surgical gloves, disposable mask, disposable plastic apron, disposable cap, disposable shoe cover, single edge razor blade, disposable sterile pad, umbilical clamp, perineal sheet, baby wrap towel, mucus extractor, sanitary napkins.

**Figure 5: Safe Delivery Kit and Its Contents**

The control group is those women who were delivered before the kits were supplied.

**OBSERVATIONS:**

**TABLE 1: showingthe incidence of various maternal complications out of sepsis in both groups**

| S.NO | PARAMETER | NO. OF WOMEN BEFORE KITS USED (CONTROL GROUP) | NO. OF WOMEN WITH KITS USED (STUDY GROUP) |
|---|---|---|---|
| 1 | Puerperal pyrexia | 5 (5%) | 2(2%) |
| 2 | Puerperal sepsis | 2 (2%) | 1(1%) |
| 3 | UTI | 5(5%) | 1(1%) |
| 4 | Secondary PPH | 2(2%) | 0 |
| 5 | Episiotomy wound gaping | 2(2%) | 0 |

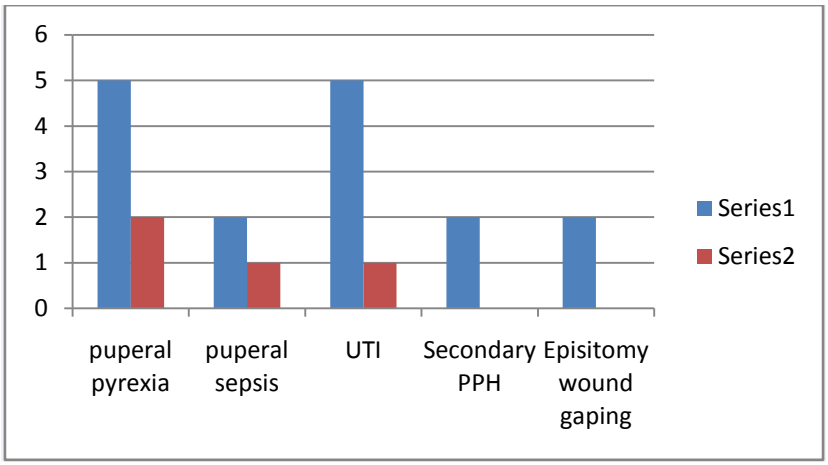
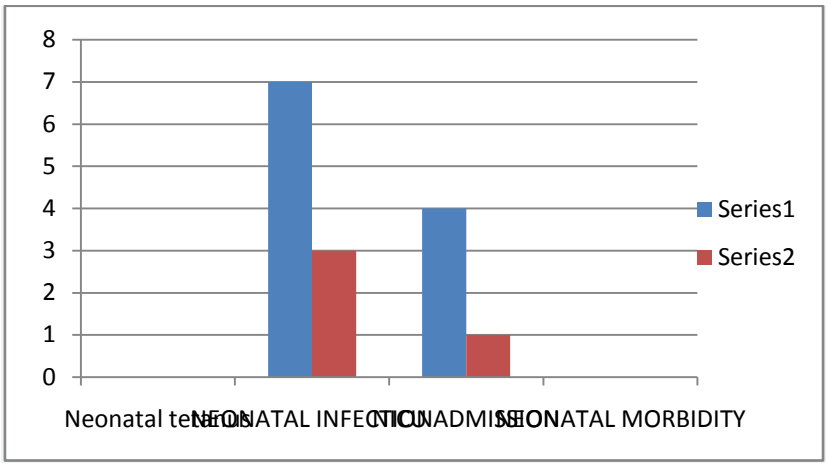



TABLE1 out of 100 control and 100 study groups 5 patients developed puerperal pyrexia in control group only 2 in study group.2 patients developed puerperal sepsis in control and only one in study group. similarly 5 patients developed UTI in control group and one in study group. secondary PPH and episiotomy gaping was seen in 2 patients each here are in control group and none in study group.

(On calculation the z value is 2.9126 and P value <0.05 which is statistically significant)

**TABLE 2: Showing the neonatal complications out of sepsis in both groups**

| S.NO | PARAMETER | NO.OF NEONATES WHOSE MOTHER NOT USED KITS(CONTROL GROUP) | NO.OF NEONATES WHOSE MOTHER USED KITS(STUDY GROUP) |
|---|---|---|---|
| 1 | Neonatal tetanus | 0 | 0 |
| 2 | Neonatal infection | 7(7%) | 3(3%) |
| 3 | NICU admission | 4(4%) | 1(1%) |
| 4 | Neonatal morbidity | 0 | 0 |




During our study there were no cases of neonatal tetanus, 7 babies developed neonatal infection in control and only 3 in study group,4babies needed NICU admission in control group where as only one in study group. (On calculation of Z value is 1.872 and P value is >0.05 which is statistically not significant.)

**TABLE 3: PATIENT SATISFACTION RATE**

| S.NO | PATIENT SATISFACTION RATE | PERCENTAGE |
|---|---|---|
| 1 | Excellent | 15% |
| 2 | Good | 80% |
| 3 | Satisfactory | 3% |
| 4 | Poor | 2% |

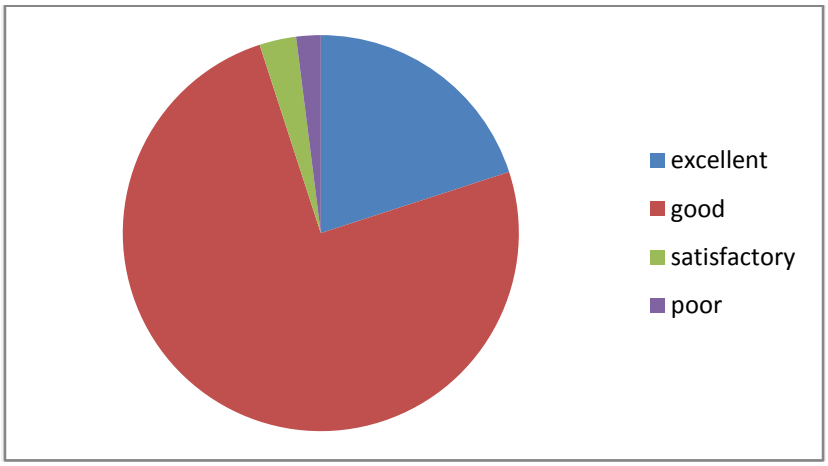



Table 3: More than 95% patients are satisfied with the usage of the safe delivery kits except for 2%who are not satisfied.Thisparameter was assessed through PSQ(patient satisfactory questionnaire) in the NHM case sheet (in local language)

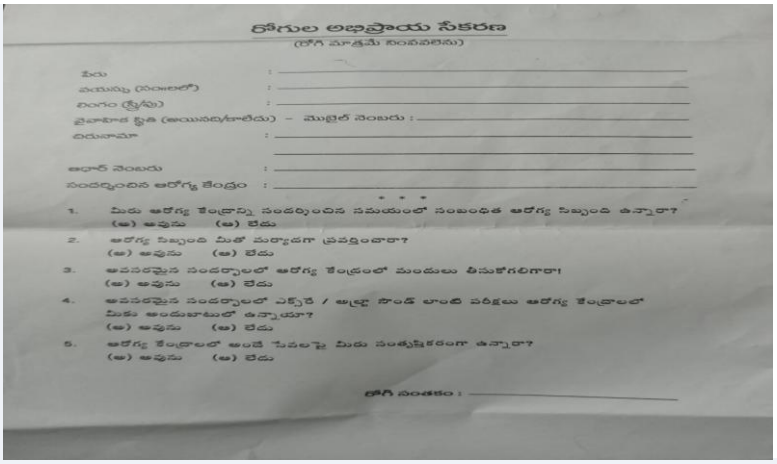

రోగుల అభిప్రాయ సేకరణ
(రోగి మాత్రమే నింపవలెను)
మీరు ఆరోగ్య కేంద్రాన్ని సందర్శించిన సమయంలో సంబంధిత ఆరోగ్య సిబ్బంది ఉన్నారా?
(అ) అవును (ఆ) లేదు
ఆరోగ్య సిబ్బంది మీతో మర్యాదగా ప్రవర్తించారా?
(అ) అవును (ఆ) లేదు
అవసరమైన సందర్భాలలో ఆరోగ్య కేంద్రంలో మందులు లేకుండా ఉన్నాయా?
(అ) అవును (ఆ) లేదు
అవసరమైన సందర్భాలలో ఎక్కువ / అల్ట్రా సౌండ్ లాంటి పరీక్షలు ఆరోగ్య కేంద్రాలలో
మీకు అందుబాటులో ఉన్నాయా?
(అ) అవును (ఆ) లేదు
ఆరోగ్య కేంద్రాలలో అందే సేవలపై మీరు సంతృప్తికరంగా ఉన్నారా?
(అ) అవును (ఆ) లేదు

**FIGURE** 6: showing patient satisfactory questionnaire form in local language.

The 2% dissatisfied group had otherwise reasons than practicing safe delivery and surgical kits.

**TABLE 4: HEALTH CARE PROVIDERS FEEDBACK**

| S.NO | PARAMETER | PERCENTAGE |
|---|---|---|
| 1 | Excellent | 20% |
| 2 | Good | 75% |
| 3 | Satisfactory | 3% |
| 4 | Poor | 2% |

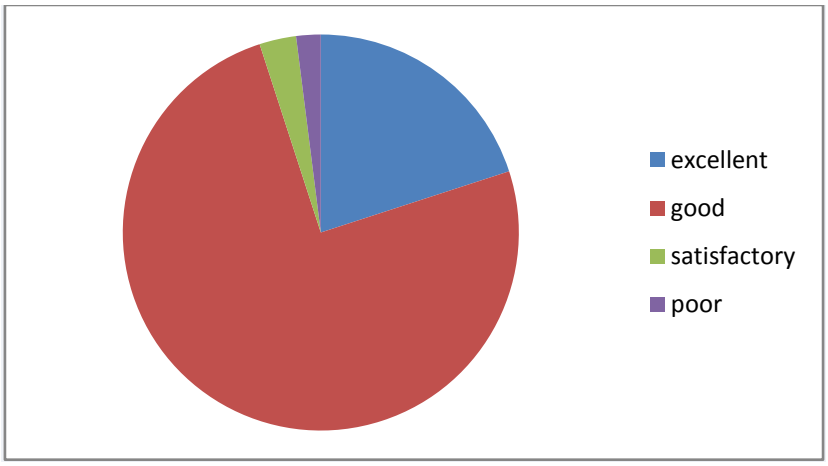



TABLE 4: In more than 95%of cases we got good feedback from health care providers, in only 2% we got poor feedback. According to them, this poor feedback is because of the apron, which they could not wear for longer periods, as it produces severe sweating.

We were supplied with surplus amount of kits by the Government of Andra Pradesh .After usage of the kits, we used to dispose them according to the biomedical wastage norms.

**DISCUSSION**

A total of 200 pregnant were included in the study who wasmore than 37weeks gestationwith normal vaginal delivery. Various parameters in mothers, neonates compared in both study and control groups, each consisting of 100 pregnant women with and without usage of safe delivery and surgical kits.

There is a significant reduction in maternal parameters like puerperal sepsis, UTI, secondary PPH, episiotomy wound gaping is noticed after the usage of safe delivery and surgical kits. Here calculated P value is <0.05, which is statistically significant and which shows there is a definitive improvement in the maternal outcome with the usage of safe delivery and surgical kit.

There is also a significant reduction in neonatal parameters like neonatal infection and NICU admission rate with the usage of safe delivery and surgical kits. The calculated P value is >0.05 which is statistically not significant. Hencethe usage of safe delivery and surgical kits were not proven to provide much advantage in neonates.

We got positive feedback from both patient and health care providers. We were supplied with surplus number of kits by the Government of Andhra Pradesh.

## CONCLUSION

Infection control practices are an important intervention for ensuring clean and hygiene delivery in health care institutions. Maternal and neonatal sepsis is an important cause for higher rates of maternal and neonatal morbidity and mortality. The Government strategy to reducesepsis in intrapartum period setting through supply of safe delivery and surgical kitsis found to be useful interventional tool to improve feto-maternal outcome and help further reduction in maternal and neonatal morbidity and mortality. The present study is endorses the above statements.

**CONFLICT OF INTEREST:** There is no conflict of interest, as it is exclusively a Government initiative in a public health care facility.

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