

Research Article**Use of Checklist as a Tool for Prevention of Postpartum Adverse Events****Bangal V B.^{1*}, Patel Menka², Aher Kunal³, Tuse Harshad⁴, Singh Shalini⁵**¹Professor and Head, Department of Obstetrics and Gynaecology, Rural Medical College of Pravara Institute of Medical Sciences (Deemed University) Loni, Maharashtra, India²⁻⁵Postgraduate Student, Department of Obstetrics and Gynecology, Rural Medical College of Pravara Institute of Medical Sciences (Deemed University) Loni, Maharashtra, India***Corresponding author**

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Abstract: Serious maternal complications like atonic postpartum haemorrhage, inversion of uterus, amniotic fluid embolism and cardiac failure are known to occur in immediate postpartum period. Use of checklist by gynaecology residents to monitor important clinical signs in immediate post partum and post operative period is known to improve vigilance and reduce maternal mortality and morbidity. The objective of the study was to assess the usefulness of checklist in reduction of post partum and post surgical adverse events. This cross sectional study was conducted at a 750-bed tertiary center and teaching hospital. A baseline data of three months duration (historical controls) was collected through document analysis to know the pattern of monitoring of immediate postpartum cases by resident doctors and the incidence and nature of maternal complications. Implementation of a checklist was accomplished following resident and supervisors training over 3 sessions. An end-line data was collected after three months to assess the usefulness of checklist in prevention of postpartum adverse events. The residents completed all checklist sections in 93% of cases. There was significant decrease in adverse events in immediate postpartum and postoperative period. The adverse event rates were 13.60% for historical controls and 3.20% for cases monitored by checklist. There was statistically significant improvement (p value <0.001) in vigilance in monitoring of the postpartum cases. Training of postgraduate students in use of checklist for monitoring of postpartum and postoperative cases brought a sense of accountability in them. The training and checklist adoption was associated with a 4-fold reduction in 5-7-day surgical morbidity among postnatal and surgical cases.**Keywords:** Post partum haemorrhage, Checklist in obstetrics, Post partum adverse events, Maternal morbidity, Maternal Mortality, Caesarean section.

INTRODUCTION

Serious life threatening maternal complications like atonic postpartum haemorrhage, inversion of uterus, amniotic fluid embolism and cardiac failure are known to occur in immediate postpartum period. Although these complications are unpredictable, they are more likely to occur in high risk pregnancies. A checklist is a type of informational job aid used to reduce failure by compensating for potential limits of human memory and attention. It helps to ensure consistency and completeness in carrying out a task [1-2]. A basic example is the "to do list". Use of checklist by gynaecology residents to monitor important clinical signs is known to improve vigilance and helps in reduction in maternal mortality and morbidity [3].

Problem Statement and Needs Assessment

Following a sudden spurt of serious maternal complications and maternal deaths after vaginal deliveries and caesarean sections over a short period of

time in the tertiary care hospital, the administrators held an inquiry about the whole issue to assess the quality of care by health care professionals. One of the factors identified was deficient supervision /vigilance in high risk and post operative cases following caesarean sections and operative vaginal deliveries. It was partly attributed to the limited manpower available for the large patient turnover (Fig.1). There was a felt need to develop a mechanism that will improve the existing patient monitoring system.

Objective

Study was conducted to assess the usefulness of patient monitoring checklist in reduction of post partum and post surgical adverse events.

METHODOLOGY

This prospective cohort study was conducted in a 750-bed tertiary care centre and postgraduate teaching hospital. A baseline data of three months

duration (historical controls) was collected through document analysis to know the pattern of monitoring of immediate postnatal /postoperative cases by resident doctors and the incidence and nature of postpartum and post operative maternal complications.

Genesis and implementation of Checklist

The simple tool was designed according to nine key components of supervision following delivery /caesarean section (Fig. 1). The content validity was performed .Tool was pretested and subsequently

modified according to the suggestions of subject experts and the users ie resident doctors. Implementation of a checklist was accomplished following resident and supervisors training over 3 sessions. Compliance of resident doctors regarding the use checklist was assessed by on duty faculty member and senior nursing staff in the postnatal ward. The completed checklists were photographed by the resident and immediately sent to faculty members through WhatsApp messaging app on cell phone. An end-line data was collected after three months to assess the usefulness of checklist.

Department of Obstetrics and Gynaecology

Check list for monitoring postpartum/post operative cases
to avert serious maternal complications

1- Name of the patient- 2- Reg. No-

3- Ward -Mat 1/ Mat 2 / 4-Bed No-

5-Date and time of delivery /Surgery-

6-Indication of surgery-

7-Reason for monitoring -LSCS / Forceps / Ventouse / Repair of cervical , vaginal tear/
Laparotomy- Rupture uterus, Ectopic pregnancy / PIH / Heart disease / Sev .Anaemia /Other

Sr. No	Clinical parameter to be checked	Time since delivery / operation			
		0 hr	30 min	1 hr	2 hr
		(Y - Yes , N - N0)			
b1	Is the patient conscious?	Y / N	Y / N	Y / N	Y / N
2	Does she obey verbal commands?	Y / N	Y / N	Y / N	Y / N
3	Pulse rate				
4	Blood pressure				
5	Is there gross pallor?	Y / N	Y / N	Y / N	Y / N
6	Is the respiratory rate normal?	Y / N	Y / N	Y / N	Y / N
7	Is there presence of cyanosis?	Y / N	Y / N	Y / N	Y / N
8	Is uterus well contracted?	Y / N	Y / N	Y / N	Y / N
9	Is there abnormal per-vaginal bleeding/ clots?	Y / N	Y / N	Y / N	Y / N
10	Has she taken orally / Is IV line functioning?	Y / N	Y / N	Y / N	Y / N
11	Has she passed urine? Is catheter draining clear urine?	Y / N	Y / N	Y / N	Y / N
12	Any other abnormal finding?	Y / N	Y / N	Y / N	Y / N
13	Has appropriate action been taken?	Y / N	Y / N	Y / N	Y / N
14	Doctors name				
15	Date and Time of examination				

Note- (Circle either "Yes 'or "No" as per the observed clinical parameter)

Fig. 1: Showing Photographs of a checklist

RESULTS

The resident doctors completed all checklist sections in 93 % of cases. There was significant decrease in adverse events in postnatal cases (Table 1). The adverse event rates were 13.60% for historical controls and 3.20% for checklist cases. There was statistically

significant improvement (p value <0.001) in vigilance in monitoring of the postnatal cases. Resident doctors, faculty members and hospital administrators gave a positive feedback about the usefulness of checklist for routine use in obstetric practice (Fig. 2).

Table 1: Observation Table (Effects of use of Checklist for monitoring of delivery and caesarean cases)

Sl. No.	Parameter	Before the use of Checklist (n=585)	After the use of Checklist (n=510)
1	Average number of clinical examinations by resident doctors within two hours of delivery or caesarean section	1.50	3.5
2	Average number of clinical parameters noted during each clinical examination by resident doctor.	2.5	7.5
3	Average number of cases of postpartum haemorrhage needing blood transfusion per month	22	08
4	Average number of cases requiring exploration in labour room or operation theatre for postpartum haemorrhage per month	4.60	1.20
5	Total no of cases requiring ICU admissions for undiagnosed /late diagnosed peri-partum complications.	08	01
6	Average number of cases requiring increased hospital stay due to peri-partum complications per month.	08	01
7	Total no. of Maternal deaths in hospital	15	01

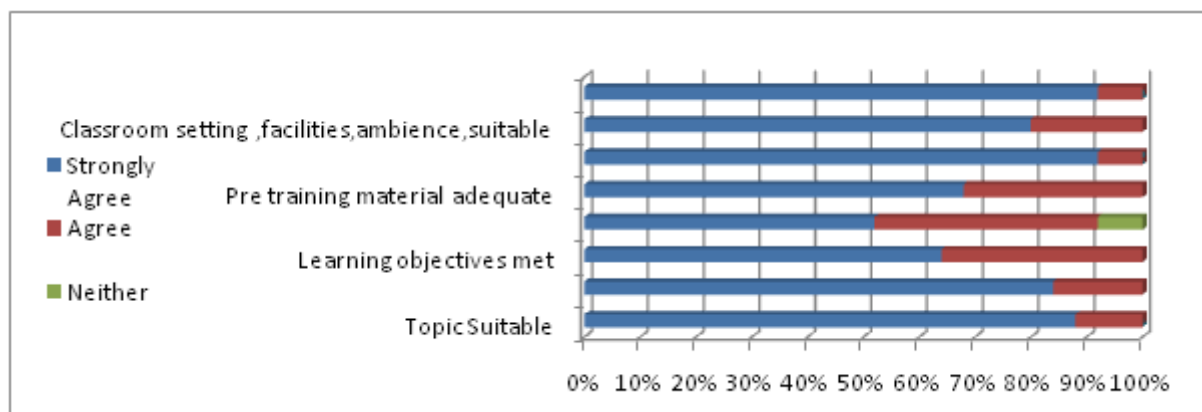


Fig. 2: Showing feedback of students on training programme on use of checklist (Likert scale 5)

DISCUSSION

Hospitals play a critical role in providing communities with essential medical care. Well-developed safety and security procedures are essential for the maintenance of safe hospitals. Effective human resource management is essential to ensure adequate staff capacity and the continuity of operations during any incident that increases the demand for human resources [4]. Check list is a simple tools used for improving the quality of care and thus reducing the errors during patient care. They are mainly useful in facilities having large turnover of patients. Checklists used in health care settings ensure completeness and consistency in carrying out the designated task [5].

Historically, the airline industry has a long history of checklist implementation to reduce risk and avoid catastrophic outcomes and is among the safest of industries for its consumers, according to Bliss *et al.* The World Health Organization has a checklist used globally to reduce postoperative morbidity and mortality, but a formal assessment of the effect of checklist adoption on postsurgical outcomes is not available [1].

In the present study, checklist was introduced for monitoring of high risk and post operative cases in obstetrics .The report of the clinical audit following increased morbidity and mortality over short span of time in tertiary care teaching hospital stressed upon the need to improve the supervision and monitoring of high risk and post operative cases through some mechanism. In response to the observations of the audit, simple check list with important nine components of clinical examination was designed and implemented following training of all stake holders. The use of checklist by resident doctors was monitored by faculty members and senior nursing staff. The lacunae and deficiencies in filling of the checklists were identified and corrected. Use of checklist helped to induce the sense of responsibility among all stake holders and resulted in reduction in maternal morbidity."No one on the surgical team is a nameless, faceless body. The checklist makes sure everyone is advocating for the patient [1].

CONCLUSION

There was significant reduction in incidence of undiagnosed atonic postpartum haemorrhage ,shock and anaesthesia related complications. Early recognition of these complications by resident doctors helped in

averting serious maternal morbidity and mortality. Training of Resident doctors in use of checklist for monitoring of postnatal and postoperative cases brought a sense of accountability in them. Use of checklist made their job easy saved their time usually spent in writing notes. Resident doctors, faculty members and hospital administrators gave a positive feedback about the usefulness of checklist for routine use in obstetric practice.

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