

Background Information

Pulmonary edema in PIH is known to be one of the leading causes of maternal morbidity and mortality. Preeclampsia accounts for 18.2% of maternal mortality in the United states of America. It is a dangerous pregnancy complication of pre eclampsia apart from congestive heart failure, renal failure, stroke and death.Early intervention and a protocol based management can significantly improve maternal and fetal outcome .It provides a standardized approach to the management and improves the delivery of clinical care processes.

Objective

The objective of this study was to implement a time bound, protocol-based bundle approach for the management of pulmonary edema as a quality improvement project from a baseline of zero percent to hundred percent.

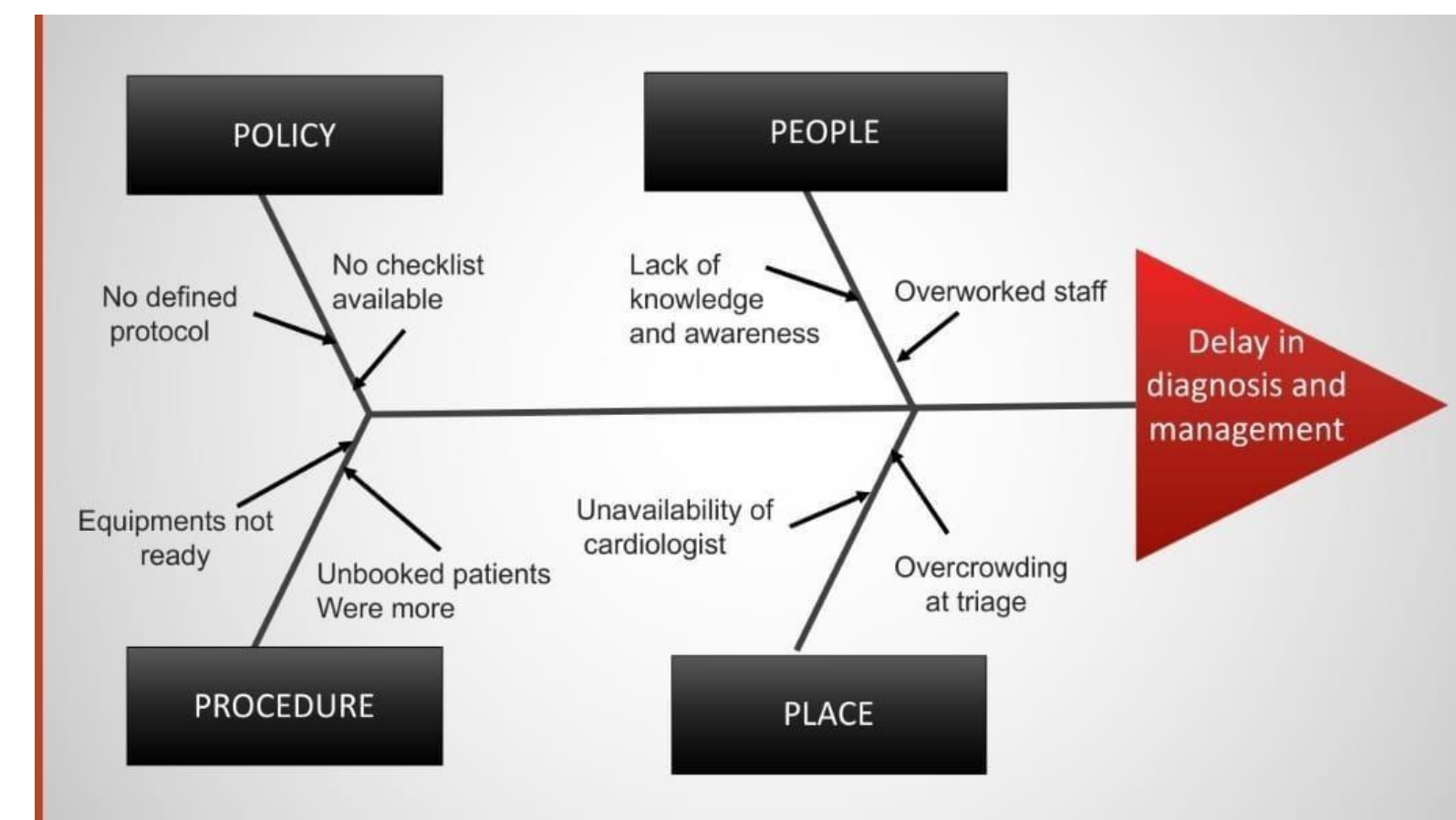
Design

Prospective observational study.

Method

This study was conducted in Department of Obstetrics and Gynaecology, J.N. Medical College, AMU, Aligarh. Time - bound, protocol based bundle was developed and implemented in patients presenting with pulmonary edema with PIH. Quality improvement tool like Ishikawa diagram and PDSA cycles were used. Baseline data was collected followed by three PDSA cycles at an interval of six months each to review the success in implementation of the bundle protocol. A total of 120 patients were admitted with pulmonary edema with PIH. Maximum number of patients were of the age group 25-30 years with a mean age of 27.5 years. Majority of population (56 %) belonged to urban areas and were primi patients.

PDSA 1



In first PDSA cycle, baseline evaluation was done and the local challenges were evaluated using fishbone diagram. The main challenges included lack of knowledge among residents and staff,no definite protocol, overcrowding at triage and unavailability of the equipments.

	PDSA1	PDSA2	PDSA3	Test of significance
Age (yr)				
Less than 25	23(46)	22(48.6)	18(48.6)	Ch sq= 2.852
25-30	25(50)	13(51.4)	17(51.4)	P = 0.583
More than 30	2(40)	0(0)	0(0)	
Urban	28(56)	22(62)	18(51.4)	Ch sq = 9.946
Rural	22(44)	13(37)	17(48.6)	P = 0.62
Primi	28(56)	21(60)	18(51.4)	Ch sq = 3.19
Multi	22(44)	14(40)	17(48.6)	P = 0.526
				NS

PDSA 2

STEP 1: Protocol Initiation - Activating emergency response and initiation of protocol

STEP 2: Clinical Evaluation -Vital assessment ,watch for signs and symptoms of PIH and pulmonary edema

STEP 3: Patient shifted to HDU

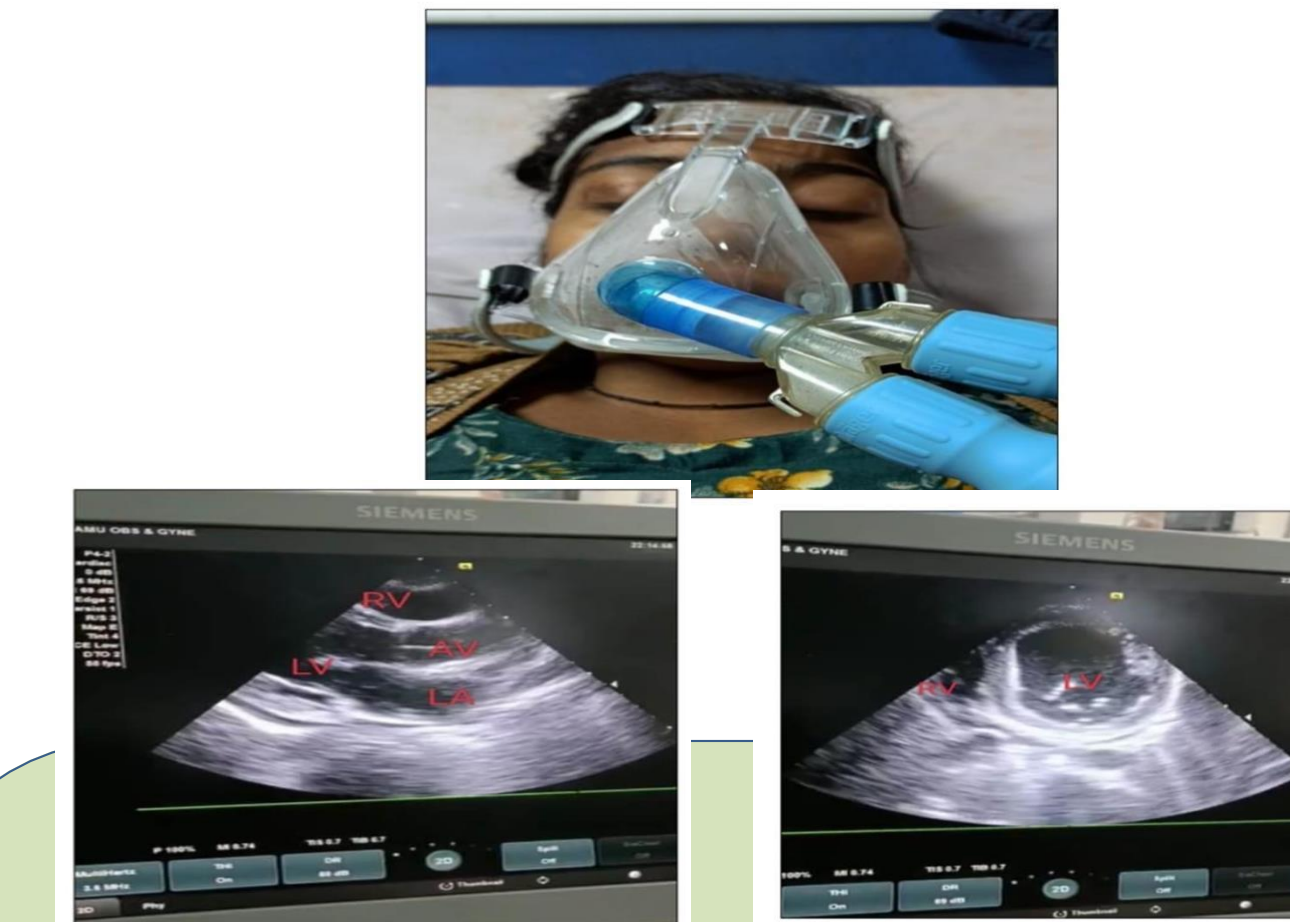
STEP 4: Initial Management -Sending lab investigations within time,magnesium sulphate and lasix administration,treating hypertension

STEP 5: Imaging Evaluation- Chest x ray,ecg and echo to be done within given time frame

STEP 6: delivery plan to be formulated

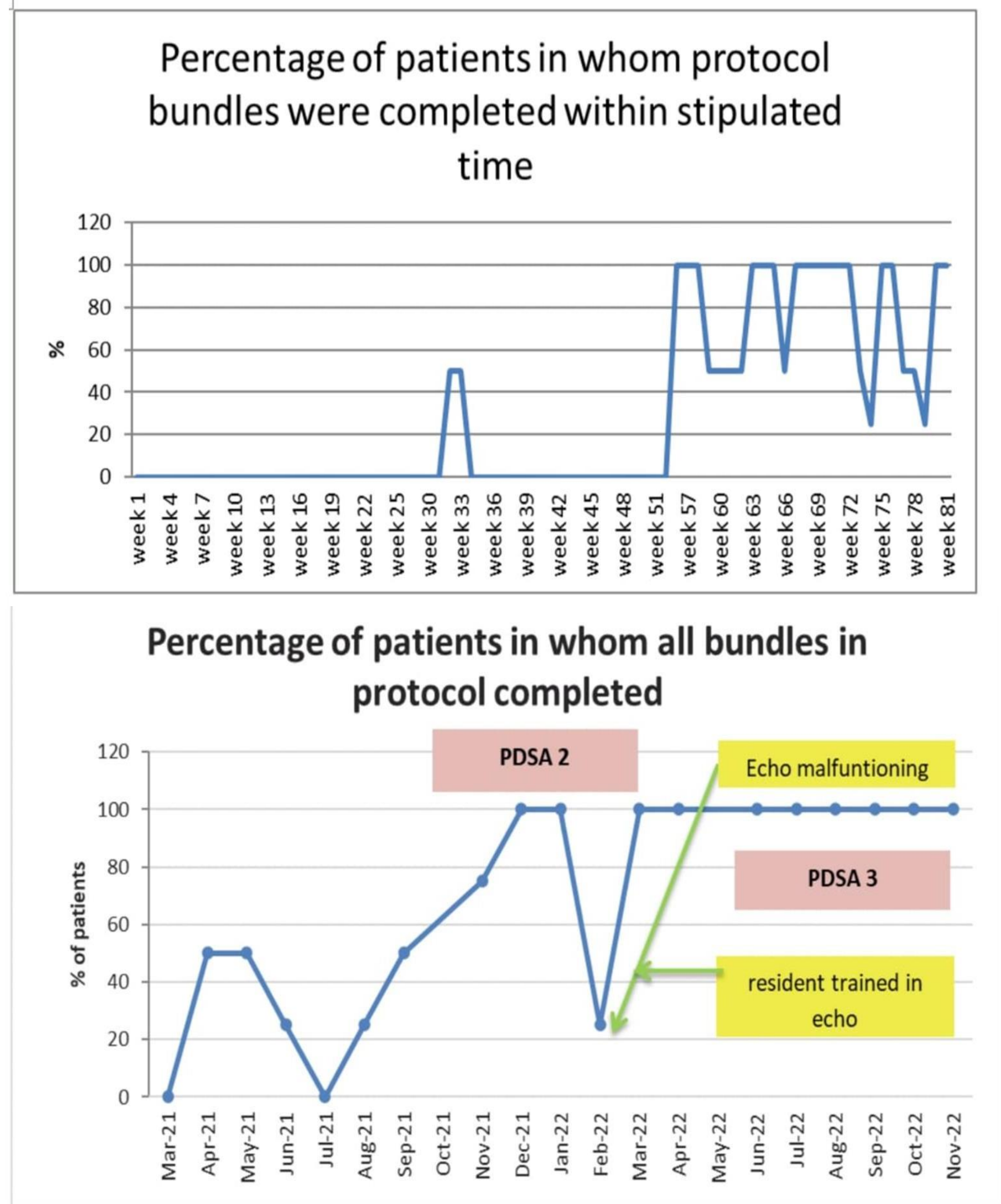
Second cycle began with the implementation of a protocol based approach and improvising the changes which were noted in the first PDSA cycle.i.e. definite protocol was made, time limit divided for each protocol bundle , residents at triage were made aware of the protocol , shifting patients to HDU .

PDSA 3



In PDSA cycle 3, Echocardiography was learnt by the resident and it was done in 100 % patients and use of NIV was introduced (14.3 % p value 0.000).

Results: The percentage of patients in which protocol bundles were completed in PDSA cycle 1 was 20% (n= 50, completed in 10 patients), 88% in PDSA cycle 2 (n =35, completed in 31 patients) and in PDSA cycle 3, we reached our target of 100% i.e. all bundles were completed in all patients of PDSA cycle 3 (n =35, completed in 35 patients).The percentage of patients in which protocol was completed within stipulated time was 62 %.



The decrease in maternal mortality was statistically significant i.e. from 32 % to 8.6 % and 22.9 % in PDSA cycle 2 and 3 respectively. However there was no significant difference in NICU admissions.

Conclusion: Pulmonary edema is a critical condition which requires immediate care and management. It can be managed effectively if there is a set protocol which provides evidence based rules and care bundles .Quality improvement projects support continuous improvement and help in statistical monitoring and analysis.