Challenges of exclusive breast feeding for new born, a problem-solving approach to improve percentage during hospital stay: A quality improvement perspective

Dr. Pillamari Niharika¹, Dr. Rita Hajela², Dr. Inderpreet Sohi²

¹Junior Resident, Maharishi Markandeshwar Medical College and Hospital, Solan, Himachal Pradesh, India
²²Professor, Department of Paediatrics, Maharishi Markandeshwar Medical College and Hospital, Solan, Himachal Pradesh, India


Abstract

Exclusive breast feeding for six months is the intended target for every newborn, but even after decades of efforts by WHO, UNICEF, UN, it still stands at 44% globally. Ground reality was no different in our set up. NICU admission was the major reason. But healthy newborn roomed in with mother were also found to be not exclusively breast fed. Individualized reasons always cropped up for giving formula milk and situation was not changing in spite of exclusive breast-feeding policy in place. Task was taken up with a quality improvement perspective. Magnitude of problem was studied, Root cause analysis done. Two reasons were found, issue of non protactile /retracted nipples in mother creating a latching issue. Late interference or unsuccessful interference resulted in formula feeds to baby. Other was complain of non production of milk/colostrum in early postpartum period by mother. Three interventions were adopted, i.e., nipple examination by pediatric team in labor room, 20 cc inverted syringe pump at outset, traditional nutrition supplement of galactogogues addressing three different issues. As a result, we were able to improve our exclusive breast-feeding rates during hospital stay of newborn from 66 % to 100 % when both baby and mothers’ condition was considered. When only infants’ heath was considered as prerequisite it improved to 95%.

We concluded that simple process of realignment of job, anticipation and rededicated remedial measures as standard operating procedure, led to quick rise in exclusive breast-feeding rates in our setup and they may be easily adopted at other places also.

Keywords: breast-feeding, infants, retracted nipples.

INTRODUCTION

WHO, UNICEF and NNF all recommend exclusive breast feeding for six months. But situation in year 2022 speaks that two out of three infants are not exclusively breastfed for the recommended first 6 months. This rate has not changed in last two decades.1WHO has set a global target to be achieved by 2025 of increasing the rate of exclusive breast feeding to 50% from current 44% for 0-6 months. To achieve this, a fresh look on the old subject becomes necessary. Reasons need to be reexplored at every level. United nations human rights commission in 2016 stated that breast feeding is a human rights issue for both child and mother and states should do more to support and protect breast feeding and end inappropriate marketing of breast milk substitutes 2. Baby friendly hospital initiative was launched by WHO in year 2001 and most of mother and child hospitals adopted it in spirit.3,4 But know -do gap has remained vast over the centuries5,6 Focused approach may give good results as appreciated in our set up.

Nonverbal communication, evident by practice during hospital stay has a great psychological impact on carry home message by parents. Adoption of exclusive breast feeding for infant and its continuation along with complementary feeding is definitely affected by how the things were addressed during their hospital stay. Mothers will be facing different challenges to exclusive breast feeding in days to come socially, emotionally, psychologically and in employment. The long-term effect of what happened during hospital stay can not be undermined. If even one formula feed is given to baby during hospital stay, the untold message to parents is that it is okay to give it to baby instead of breast milk if needed.

Re-exploration of exclusive breast feeding was planned with a quality improvement perspective. General observation of one or few formula feeds was ongoing as a common practice in healthy mother and baby dyad. In spite of an exclusive breast-feeding policy in place, practice appeared to be not so. Reasons offered were individualized, vague and ambiguous.
It was done in two phases, initially in a short period of time and later it was extended to watch for sustainment of work.

Methods: (Phase 1)

Identification of Probe (Practice gap identified). Exclusive breast feeding is not being practiced in 100% cases in mother and baby dyad even when both are together and apparently in satisfactory healthy condition. NICU babies were excluded from the project. SQUIRE 2.0 guidelines have been followed for reporting the project.

As actual authentic data on the magnitude of the problem was not available, data was collected from 3rd to 22nd January 2022 for 15 days by Unit III of the department of Pediatrics. There were 17 deliveries kept in the obstetric ward with rooming-in and 5 were given formula milk (lactogen). A whopping 34%, leading to a fall to 66% against an aim of 100 percent.

Aim: To improve the percentage of exclusive breast feeding among healthy newborn in obstetric post partum ward in mother and baby dyad while in hospital from existing 66% to 95% in 15 days starting from 3.02.22 by 22.02.22 via a quality improvement project approach.

Team formation: A team of eight persons was formed involving personnel at every level involved in baby care. Root cause analysis was done using the tools of process flow chart, fish bone analysis and 5 why.

![Process flow chart](image)

**Figure 1:** Flow chart illustrate the process of study
Know do gap

On asking nurses, Junior doctors, consultants everybody knew that exclusive breast feeding is best for baby. In practice giving one or two lactogen feeds were considered harmless. Nurses, junior doctors took it very lightly and considered that they are still practicing exclusive breast-feeding Preventive steps to identify nipple problems are not taken. Obstetric team was not really concerned about exclusive breast feeding, they were focused on wellbeing of mother from PPH, Stitch pain and infection etc. If baby was hungry and mother not able to feed give lactogen. Pediatric team did their job on mothers complain, once damage has already been done while some mothers may not complain initially considering it normal.

Five why Tool Analysis

Why 5 newborns were given formula feed? Four had latching issue because of flat/retracted nipple, one had no milk.

Why flat/retracted/ nonprotractile nipple was not diagnosed antenataly or before first feed?

Mother was under obstetric team care (not under control of Pediatric team). Failure was not foreseen by Pediatric team. Obstetric team was not very much concerned of baby latching issue.

Why then pediatric team looks into latching issue? Baby did not get human milk or looses excessive weight or mother complains and matter comes into light, when one or two nonhuman milk had been fed to baby.

Why latching issue was not foreseen by Pediatric team? Mother was under Obstetric team care. Because it was never a routine.

Why in spite of 10 cc inverted syringe pump being used 7,8, family members/nurses gave non-human milk. Because it is sometimes successful sometimes not.

Why 10 cc inverted syringe pump is unsuccessful? Its diameter is small and it may press sensitive nipple tissue and cause pain, sometimes enough breast tissue is not sucked in to form nipple. It does not create enough suction pressure to pull sufficient areola to form nipple. 20 cc inverted syringe pump was prescribed on failure of 10 cc and was found to be successful or patient discharged with advice and not followed up. 9,10
Identified root cause: (1) late detection of flat or retracted nipple (2) prescription of 10 cc inverted syringe pump at first instance instead of 20 cc

Second Reason: No breast milk is an extremely rare phenomenon, usual a consequence of emotional/ psychological issues.

Rationale for changes: Pediatric team is too much dependent on obstetric team for execution of exclusive breast feeding of baby. Obstetric team considers infant feeding under the purview of Pediatric team, boundaries are vague. Pediatric team plays its role once the natural process failed.

Identified solutions: (Process change)

1. Elimination of dependence on Obstetric Team for an issue concerning baby. Examination of mother’s nipple to be done by Pediatric team, in labour room by pediatric nurse and junior doctor attending delivery. (Eliminating privacy issue). Findings will be recorded in newborn file by attending pediatrician.

2. Its documentation in newborn file for identification of flat retracted /nonprotractile nipples for antecpation and prevention of any formula feed.

3. Provision of 20 cc Inverted Syringe as an effective treatment for flat /partial or totally retracted nipple

4. Counselling may not be sufficient, therefore to relieve mothers’ anxiety, psychological issues, for getting benefit of placebo effect, no harm in using traditional nutritional supplement of galactogogues. (Dietary modification)

Table 1: Identification of various solutions

<table>
<thead>
<tr>
<th>Category of changes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve knowledge or skills</td>
<td>Training sessions with topics covered</td>
</tr>
<tr>
<td>Eliminate waste</td>
<td>Initial use of 10 cc syringe (50% success or delayed results)</td>
</tr>
<tr>
<td>Reassign task</td>
<td>Nipple exam by peds team</td>
</tr>
<tr>
<td>Improve patient relationship</td>
<td>Prevention of random use of lactogen use / promotion of Exclusive breast feeding / counselling &amp; encouragement / Quick help</td>
</tr>
<tr>
<td>Reduce variation</td>
<td>SOP &amp; Printed material display</td>
</tr>
</tbody>
</table>

Considerations for Interventions: safe, effective, patient centered, timely and efficient.

Other changes: concerning implementation and adoption of changes.

5. Printed information: displayed at key points

6. Financial incentives: Not given

7. Training for implementation of changes to be adopted

8. Standard operative process (SOP) documented and agreed in departmental meeting.

Operational definition
• Exclusive breast feeding: defined as feeding infants only breast milk, be it directly from breast or expressed except drops or syrup or mineral supplements or medicine.

• Healthy baby and mother dyad in post delivery ward/room: Baby irrespective of gestational age or birth weight is well enough to be roomed in with mother. Mother irrespective of mode of delivery is healthy enough to breast feed baby either with assistance of care givers or by herself.

• No milk in mother: Even 1 drop of milk can not be expressed after massaging and properly expressing both breast after 12 hours of delivery after a counselling session. Traditional nutritional supplement of galactogogues (Lactate granules two tea spoon three times daily for 5 days) would be offered to them.

• Context: Contextual elements considered at the outset before introducing changes like privacy issue, male pediatrician, indicators of measures, how they will be recorded, logistics were outlined.

Study of Interventions:

• Planning stage: From 24th January to 2nd Feb project entered into planning phase.

• Measurement indicators were developed. Three changes and Three PDSA cycles were designed.

Intervention 1: PDSA Cycle 1: Nipple examination of mother

• When: at the time of showing baby to mother

• Where: in labour room (eliminating Gender issue & Privacy issue)

• Who will do: Ped doctor attending delivery of baby along with ped nurse attending delivery)

• Who will record: Ped doctor who attended delivery

• Where will they record: in newborn file, in portion of maternal history

• What will be recorded: Nipple Examination report, Left and right nipple normal or retracted

• Any latching issue expected or not

• If yes /? inverted 20 cc syringe pump provided before first feed.

• Nurse assigned for help till mother is confident to do it herself

• JR assigned to Recheck if everything went well as planned and no formula feed given
Testing changes: PDSA Cycle

Is the change feasible?
Did the change lead to improvement?

Figure 3: Testing changes: PDSA cycle

Indicator

(A) How many deliveries took place in hospital during 15 days of measurement

(B) In how many files the record of nipple examination was available on audit

(No. of Nipple exam report found in file / total number of live birth newborn files) x 100

the change led to anticipation of latching issue before initiation of first feed

Change was found to be feasible, Change led to improvement. Change was adopted. Initially some forgot but with reinforcements and training all involved got adapted to it, as it did not involve much time-consuming additional burden in their work.

Intervention 2: PDSA Cycle 2: Provision of 20 cc Inverted Syringe as an effective treatment for flat /partial or totally retracted nipple (Technology Base). It was harder to cut 20 cc syringe but within acceptable limit. Record to be kept in newborn file in feeding column.
Indicator: (No of mothers provided inverted 20 cc syringe pump at the time of initial prescription / No of mothers identified with latching issue due to nipple problem) x 100

Change was found to be feasible, change led to improvement and change was adopted in SOP along with counselling part. Counselling to go with change: it usually takes 3-4 days to a week or so to become nonprotractile nipple to become protractile. If message is not clear and supportive, mother considers that she will have to use it for 6 months every time she feeds, then compliance of its use is unlikely to happen at home. Falling prey to formula milk sooner or later would then be the usual outcome. No case of failure occurred which was 25-50% with 10 cc syringe pump earlier.

Intervention 3: Provision of traditional nutritional supplement at 12 hours post-delivery if mother complained of no milk production as per operational definition. Recorded in newborn file in feeding column.

Indicator 3: (No of mothers who were prescribed nutritional supplement at 12 hours post-delivery/ No of mothers who complained of no milk production) x 100

Ethical approval: Institutional ethical approval was taken.

Analysis: Analysis of data showed a definite improvement to our target levels and changes were found to be acceptable, feasible and economical. The intervention two and three were counted for analysis purpose in mother and baby dyad shifted to postnatal ward with rooming in of baby while mother was conscious with no complication & baby not shifted to NICU.

Phase II

Objective:

1. To assess degree of fall back when there are no reinforcements by consultants or when frontline workforce is not answerable for not adopting the policy, interpreted as degree of self motivation for practicing exclusive breast feeding.

2. To assess degree of success of adopted policy in a larger data.
Methods:

A retrospective analysis from files of all newborns born from 27th Feb 2022 to 10th May 2022.

Indicator 4: Degree of self motivation for adoption of policy change, was measured by, availability of report of nipple examination of mother in labor room, (if done or not as recorded in newborn files.)

Indicator 5: Degree of success of adopted policy in larger data was measured by record of exclusive breast feeding /record of formula feed given to baby during hospital stay.

Once the policy was adopted in our department, onus of further carrying over of policy was of 2nd year Pediatric residents, who were mainly responsible for attending to all deliveries in labor room as first responders. They were also responsible for providing further care as per policy in wards and NICU to all newborns. No questions were asked by any Seniors regarding policy implementation after the project was closed on 26th Feb 2022, neither during routine rounds, nor during any other interactions, academic discussions etc.

After about two and half months this retrospective analysis of gathered, data was done to find the facts

Results of Phase 1 initially : PDSA cycle 1 was repeated three times to achieve 100% targets, as initially the team which tested for adaptation did not forget to examine nipple and results were 100 % but when other teams attended delivery, they forgot to implement it and it took time to adapt to change.

Indicator 2 and 3: Team which tested change was 100 % successful, but other teams attended forgot to implement it timely and it took retraining, counselling, and motivation to adapt to change. All three changes were adopted. After 15 days of adaptation process, success was 100 % and no failure occurred.

Intervention 1: PDSA cycle 1 tested for 48 hours

6 deliveries (from 12/02/22 to 14/02/22) six deliveries took and nipple examination was done and recorded in all 6 result 6/6 x 100 = 100%. No difficulties in implementation found

5 baby were shifted as mother baby dyad in postnatal ward for rooming in and as none had latching issue, implementation of Intervention two or three was not required.

Intervention 2: From 08/02/22 to 22/02/22 out of 19 delivery 4 had partially retracted nipple and they were anticipated to have latching issue. PDSA Cycle 2 tested. They were given 20 cc inverted syringe pump and nipple formation was achieved; no formula feed was given to them. No issue in implementation was identified 4/4 x100 = 100 % success

Intervention 3: From 03/02 /22 to 22 /02/22 only two mothers had problem of no milk by 12 hours and they were counselled for continued sucking by baby and nutritional supplement of galactogogues in form of Lactare granules was provided. In all lactation was established soon, within next 12-18 hours. No formula feed was given to baby and baby neither suffered any excessive weight loss, nor cried, or any other issue like hypoglycemia occurred. Target of exclusive breast feeding achieved 2/2 x100 = 100 %

Effect of interventions in total 19 deliveries roomed in. Exclusive breast feeding practiced in 18. One mother developed seizures and went into status epilepticus, she was not able to feed baby, formula feed given because of mother’s condition. 18/19 x 100 = 94.73 %.

If clinical status of only baby was considered effect of intervention was 100%

Adaptation, extension & sustaining changes. There was hesitation in adoption of intervention three initially, frequency of such incidence is also not high, sustainment of project and extended results will be measured after 3 months.

Modifications in interventions for adoption: none
Costs: Rise 14 x 4 = Rs.56 (4/19 cases 20 cc syringe instead of 10 cc), 290 x 2 = Rs 580 (2/19 for Lactare granules) Reduction: Rs 360 x 19 = 6840 (non purchase of formula milk). Overall cost benefit 6840-( 56+ 580) = Rs 6204

Missing data: none

Figure 5: Time line of project

Results of Phase II

Table 2: Indicator of self-motivation for adoption of policy (70.29%)

<table>
<thead>
<tr>
<th>Division of work</th>
<th>No. of Deliveries</th>
<th>Number of cases where Nipple examination was done in labor room &amp; report mentioned</th>
<th>Percentage of cases where Nipple examination was done</th>
<th>Number of cases where Nipple examination was not done</th>
<th>Percentage of cases where Nipple examination was not done</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit I</td>
<td>47</td>
<td>26</td>
<td>55.31%</td>
<td>21</td>
<td>44.68%</td>
</tr>
<tr>
<td>Unit II</td>
<td>42</td>
<td>33</td>
<td>78.57%</td>
<td>9</td>
<td>21.42%</td>
</tr>
<tr>
<td>Unit III</td>
<td>49</td>
<td>38</td>
<td>77.55%</td>
<td>11</td>
<td>22.44%</td>
</tr>
<tr>
<td>Total</td>
<td>138</td>
<td>97</td>
<td>70.29%</td>
<td>41</td>
<td>29.71%</td>
</tr>
</tbody>
</table>

(There were 138 deliveries during this period with a further Unit wise break as follows)

Out of 138 deliveries 117 newborn were shifted to ward and were kept with mother, while 21 were admitted to NICU in immediate postnatal period and hence were excluded from study for further analysis as per inclusion and exclusion criteria.

In 41 cases where nipple examination was not done, out of these 16 received formula feed. (39%). Preventive action as per policy might have reduced this number, as per our experience from Phase I. Amongst them 12 were in ward and 4 were admitted in NICU. NICU admitted patients were excluded from further analysis.
Out of 117 (Excluding 21 NICU shifted patients), deliveries 84 remained on exclusive breast feeding while 33 were given formula feed, giving an incidence of exclusive breast-feeding rate of 72 % (a fall to near original level of 66 %) 

Out of 117 deliveries in ward, there were 97 deliveries where nipple examination was recorded in labor room. Nine cases of flat / partially /completely inverted nipples were observed amongst them, requiring immediate attention and action for successful exclusive breast-feeding practice, giving an incidence of 9.27%. 

Amongst the 9 cases, 3 cases were from those who were admitted in NICU, hence excluded. From 6 cases who were kept in ward all were prescribed 20 cc syringe for formation of nipple. i.e. 100 % compliance for policy. Out of 6 it was successful and baby was given exclusive breast feeding in 5 giving a success rate of 83.33 %. One baby whose mother had grade 3 nipple inversion; it was partially successful. This baby developed excessive weight loss and dehydration fever and was then given formula feed, giving a failure rate of 16.67 %. 

Of 117 cases in ward there were 14 cases where less milk complain was noted in mother, and were prescribed Lactare granules 2 tsp three times a day as per policy and it was successful in all cases (100%) and all newborn remained on exclusive breast feeding. 

Discussion: 

Multiple interventions were adopted towards achieving one single cause. Breast feeding is the most natural act, its benefits are immense and need no further clarification or support. scientific evidence is there not only for its nutritional value but for its other benefits of social emotional cognitive bonding all are there and need no mention (References) benefits. The seeds of exclusive breast feeding are sown in hospital immediately after baby is born. Whatever is practiced in hospital has a great impact on thinking and behavior of parents not only in short term but also in long term. Therefore, any effort for establishing exclusive breast feeding is worth doing even if it involves cost. Here we were able to change the picture by changing the responsibility, anticipating problem and preventing it from occurring. A paradigm shifts from cure to prevention. Interventions identified were simple to execute, ambiguity of responsibility eliminated and low cost most beneficial remedies offered at outset. When policy was under supervision, as part of discipline, an order to be followed with periodic reinforcements and motivation, the compliance was 100 %. But as soon as it became part of self motivation there was a fall to 70% level within immediate next 2 and half months.
Summary:

Exclusive breast feeding for 6 months is the most valuable thing done for survival and health of baby. The policy is well adopted in theory but in practice the picture is different. For any small or big reason some formula feed is given to baby without considering its long term psychological and other impacts. Retracted nipples, late establishment of lactogenesis are few common reasons in hospital set up for giving formula feeds in beginning while counselling and treatment are established. late interference causes a setback to exclusive breast-feeding policy. Traditionally these problems have been taken care of by obstetricians. The shift in responsibility as a policy change, anticipating the problem and providing remedies at the outset may increase may change the picture all together. Three simple interventions of nipple examination by Peads team in delivery room, provision of 20 cc inverted syringe pump and nutritional galactogogue supplement at right time changed the picture in our set up from 66% to 95%.

Interpretation: Three simple interventions of nipple examination by Peads team in delivery room, provision of 20 cc inverted syringe pump and nutritional galactogogue supplement at right time changed the picture in our set up from 66% to 95%, and this change may be adopted quickly in other hospital deliveries also if they also suffer from these common hindrances in implementation of exclusive breast-feeding policy.

Limitation: Newborn admitted in NICU were not included in study

Conclusions:

We recommend adoption of the three above discussed simple measures to change the larger picture of exclusive breast-feeding goals effecting the health and survival of baby considering the told and untold benefits of breast feeding. Remember that whatever has been practiced during hospital has an unwritten impact on prejudice and pride of breast-feeding issues in rearing the baby.

Preventive steps even trivial in nature, requiring only few seconds of time cannot be expected to be followed by all. (70% compliance)

Achieving change in habit is not a one-time job, continued efforts will be needed to change habit even for young minds.

In spite of clearcut policy on prescription of nutritional supplement possibility of over prescription remains.

Limitations of study

The missing data of 41 cases may introduce an element of bias / confounding in our analysis.

Possibility of variability in time of introduction of lactare granules and unnecessary prescription of Lacatre granules could not be excluded, as prescription on mothers complain only remined a possibility, without following the manual expression procedure and as its documentation was missing from files. Therefore, on this count possibility of over prescription without giving a chance to natural process could not be excluded.

Funding: Nil

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