



## RESEARCH ARTICLE

### HOLISTIC ANTENATAL CARE FOR RURAL AREAS - CHALLENGES AND SOLUTIONS

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#### ABSTRACT

**Background:** Several factors play important role in expectant mothers seeking Antenatal Care in rural areas like socioeconomic status, availability of modern medical facilities, transport etc. Lack of these factors keep her away from early registration and make her and baby prone for complications. Objective- Community based holistic management of pregnancy and its outcome to reduce maternal and perinatal mortality and malnutrition in rural areas.

**Methods:** It is a retrospective record based analysis from rural hospital from January 2009 to August 2016. Pregnant women from 52 remote villages were registered. Holistic antenatal care was provided in the community. High risk mothers were identified and treated at hospital.

**Result:** Total deliveries in study period were 4930, 37.11% were identified as high risk mothers. Maternal mortality Rate (MMR) was nil, perinatal mortality was 1.99%. Percentage of LBW (LowBirthWeight) was 34.34% & progressive increase in institutional deliveries.

**Conclusion:** This study demonstrated the effectiveness of community-based holistic antenatal care due to functional modern medical infrastructure, trained staff at rural hospital and a strong community network. It has created a strong foundation to plan a prospective study.

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## INTRODUCTION

Being pregnant is the happiest moment in life of female as well as family. In this crucial physiological transition, family dynamics changes & more responsibility is posed on family members as well as health care providers. Every cloud has a silver lining, considering the silver line, WHO addressed the issue by themes such as "pregnancy is precious-make it safe"& make every mother & child count. India accounted for one third (45000) of all maternal deaths worldwide in 2015. MMR in Maharashtra was 67 in 2013. (Estimates, 1990) United Nations Millennium development goal 5 aimed at reducing MMR by 75% over the period of 1990–2015. (United Nations Millennium Development Goals, 2015) Till 2016, India still receding to achieve this target. MMR, Neonatal Mortality Rate, pre-maturity, among children born to undernourished mothers is high. Intrauterine period is a critical period for growth of fetal organs, makes baby susceptible to Diabetes, Hypertension, cancer in its later life. (Jens *et al.*, 2014; Deshpande *et al.*, 2013; Krishna *et al.*, 2015; International Journal of Epidemiology, 2013; Josef Neu, 2015; Heather A. Paul, 2016; Sarah R. Dash, 2014) If the risk of many diseases of adulthood is determined before birth, then only way to combat this is to

focus on health of pregnant mother. Considering these facts, need for improvised care was addressed by BKL Walawalkar Hospital from Jan2009.

## MATERIALS AND METHODS

BKL Walawalkar hospital is tertiary care centre situated in Dervan village near chiplun serving rural kokan community with various community activities and intervention programs which in turn are unique in rural Maharashtra. The hospital developed wide network to 150 government aganwadies and 52 nearby villages. This is a record base data analysis of pregnant women from January 2009 to August 2016. In total 4930 constituted the study subjects who received improvised door step maternity care along with routine maternity checkups through chain of network by 50 trained nurses, Social workers and specialists in a standard protocol format. The improvised care includes- Registration, Immunization, Education, Supplementation of nutritious laddoo, medicines etc., screening of high-risk pregnancies with timely treatment, ambulance services & socio culture workshops such as baby shower ceremony, maher yojana, sasu-sun melava etc. & various capacity building workshops and trainings for paramedic staff & aganwadi workers involved in improvised maternity care. Three nutritious laddoo's per day (containing vitamins A, C, B1, B2, B3, Zn, Ca, Fe and protein, carbohydrates, fats) were

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supplemented for 9 months. Each laddoo weigh 50 gm giving 410 Kcal. Each mother underwent obstetric sonography minimum twice, maximum 4 times. Base hospital had well equipped labor rooms, operation theatres, anesthesia, obstetrician, pediatrician backup round the clock, blood bank, component facility, medical and neonatal intensive care and hemodialysis unit. All high risk mothers were treated at this hospital. All babies were weighed after delivery and baby kit(baby suite, diaper, mattress) was gifted to mother. Data analysis made using appropriate statistical procedures.

### Statistical Tables

**Table 1. Data Analysis of registered pregnant women**

Years	2009	2010	2011	2012	2013	2014	2015	2016	Total
No of ANC	397	377	381	708	824	828	691	461	4667
No. of high risk (%)	63 (15.86)	45 (11.93)	261 (68.50)	215 (30.36)	386 (46.84)	327 (39.49)	327 (47.32)	108 (23.42)	1732 (37.11)
Delivered Outside (%)	127 (31.98)	59 (15.64)	33 (8.66)	43 (6.07)	42 (5.09)	29 (3.50)	6 (0.86)	0	339 (7.26)
Delivered in the Institute (%)	270 (68.01)	318 (84.35)	348 (91.33)	665 (93.92)	782 (94.90)	799 (96.49)	685 (99.13)	461 (100)	4328 (92.73)
Live births (%)	397 (100)	366 (97.08)	363 (95.27)	687 (97.03)	802 (97.33)	812 (98.06)	686 (99.27)	461 (100)	4574 (98.00)
Perinatal deaths (%)	0	11 (2.91)	18 (4.72)	21 (2.96)	22 (2.66)	16 (1.93)	5 (0.72)	0	93 (1.99)
MMR (%)	0	0	0	0	0	0	0	0	0

**Table 2. Year-wise response to various activities by respondents**

Attendance	2009	2010	2011	2012	2013	2014	2015	2016
ANC attendance for awareness at anganwadi	24%	29%	58.90%	73%	71%	79%	78.12%	82%
Baby shower	5%	28%	45%	37%	54%	71.80%	84.31%	79%
Mother in law workshop	2%	12%	41%	45%	56%	68.90%	72.80%	71.90%
Village leader work shop	5%	8%	23%	22%	36.60%	41%	53.90%	63.50%
Ladoo consumption	19%	34.90%	46.32%	58.23%	66%	68.56%	79.31%	81%
Ambulance service	0%	0%	5%	19.80%	37%	31%	32%	29%
Maher yojana	0%	0%	0%	10%	14%	21%	33%	28%

**Table 3. Status of birth weight**

Weight of Babies (N=4574)			
Variable	N (%)	Male (%)	Female (%)
No of babies with birth weight $\geq$ 2.5 kg	3003 (65.65)	1590 (52.94)	1413 (47.05)
No. of babies birth weight < 2.5 kg(LBW)	1571 (34.34)	728 (46.33)	843 (53.66)
Sex ratio is 971 female births per 1000 male live births.			

## RESULTS

Total registered respondents were 4930.No. of mothers followed up to end of study were 4667 because 263 lost to follow-up. Gravida status was found to be 49.85% & 50.15% as primi & multi-gravid respectively. More than 2/3rd pregnant women i.e. 84.76% belonged to age range of 20 to 34 years. Year-wise distribution of registered pregnancies showed increasing trend for deliveries at BKLW hospital i.e. 68% in 2009 to 100% up to end of August 2016.Overall percentage of high risk mothers was high (37.11%) There was year wise increase of high risk pregnancies as more pregnant women started enrolling for antenatal-care and referral services. The record revealed zero maternal mortality during study period. Declining trends were observed for LBW & perinatal mortality. Utilization of improvised maternity care package showed increasing trends over the period of time as response to awareness program was increased from 24% to 82%, baby shower from 5% to 79%, mother in law workshop 2% to

71.9%, capacity building workshop for village leaders was augmented from 5% to 63.5%, laddoo consumption improved from 19% to 81%, ambulance services were utilized from 0% to 29% & maher-yojana utilization increased from 0% to 28%.

## DISCUSSION

The Konkan region, on the Western coast of Maharashtra, is characterized by mountainous terrain with poor soil quality, hot humid weather and poverty, paucity of tertiary health care facilities, deep rooted superstitions has led to wide spread malnutrition amongst people of Konkan.

Women in this region, remain malnourished because of early marriage, inadequate spacing between pregnancies, insufficient diet and social practices cited against women and heavy physical work on farm. Maternal malnutrition, poor hygiene, thyroid diseases, polycystic ovarian disease, diet, infection, mode of delivery has its effect on maturation of various organs of the baby. As per Darton-Hilli *et al* Epigenetic influences and the likely influence of micronutrient deficiencies on fetal origins of adult chronic diseases are currently being clarified. (Dartton-Hilli1, 2015) Though prenatal and antenatal period represents both a risk for adverse programming but also provides a window for opportunity of intervention in cases of adverse fetal programming. (Marianne Vidler *et al.*, 2016) Therefore there is a need to identify this opportunity and improvise antenatal care in Rural area. As per the FOGSI study in Kerala 2013, majority of these referral institutions failed to provide critical care management that those referred patients needed. This was either because such hospitals lacked adequate bed provision to accept such referral load, or such facilities were nonexistent. This meant that the management did not

achieve the goal of averting maternal deaths irrespective of the center management, be it at the Government rural referral or tertiary care urban hospitals. (Hiralal Konar and Asit Baran Chakraborty, 2013) Lack of transport, inadequate health care facility, lack of continuity care, haphazard referral systems and distorted accountability mechanisms is associated with maternal deaths in Karnataka as well. (Marianne Vidler *et al.*, 2016) These challenges were overcome in our study by arranging workshops for mother in laws and convincing them for institutional delivery, providing ambulance, encouraging mothers for taking her own decisions. At the same time modern medical facilities were made available to treat very high risk mothers at the base hospital. This has led to reduction in MMR and institutional deliveries rose up-to 97.08%. Percentage of Institutional delivery in rural Maharashtra by NFHS-4 was 87% in 2015. (Darnton-Hill, 2015)

In rural Haryana, prevalence of High risk mothers was 10 % and out of them 36.7% was from lower education group as compared to higher education group (24.9%). (Bharti *et al.*, 2013) In our study, percentage of high risk is 37.11% as mothers were from low socioeconomic group, less educated and widespread malnutrition. MMR was 87 in Maharashtra and 178 in India in 2012. It has dropped down to 68 & 167 in 2013 respectively. (Jens H. Nielsen *et al.*, 2014) Maternal deaths are zero due to holistic antenatal care in our study. Perinatal mortality rate of India has dropped down from 42.5 in 1994 to 37 in 2007 /1000 live births. (Jones-Smith *et al.*, 2013) In our study overall perinatal mortality is very low (1.99 %). India accounts for 40 % (8 million) of LBW all over world and 20% new born are LBW. Males have less frequency of LBW than females. Mother's education, TV, socio economic influence determine birth-weight. (Cedric and Taylor, 2014) As per our data high percentage of LBW (34.34%) is explained by maternal malnutrition, poverty, more no. of female babies (57.35%) and high risk mothers.

## Conclusion

This study demonstrated the effectiveness of community-based holistic antenatal-care, public private partnership and availability of functional modern medical infrastructure for rural area in improving pregnancy outcome. It has created a strong foundation to plan a prospective study.

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