Dr Chandrakala.BS

Assistant professor ,Neonatology

St John's medical college hospital, Bangalore

IMPACT OF KANGAROO MOTHER CARE ON LACTATION

Michelle J Vaz, SwarnaRekha Bhat, Chandrakala BS, Suman Rao PN, Saudamini Nesargi

Introduction

- 25 million LBW infants each year, 96% from developing countries
- Financial and human resources - limited
- Interventions - neonatal morbidity and mortality and costs
- Indian scenario : 27 million babies are born every year

  30% - LBW

  75% -neonatal mortality -LBW

Udani R et al 2010

Kangaroo Mother Care (KMC)

- Emerged out of necessity in Bogota, 1978 - Edger Ray
- Shortage of incubators
- Impact of women and newborns separation

Ruiz-Pelaez et al. BMJ 2004
Rey E et al, Cursode Medicina Fetal, 1983.

- An effective means of meeting -warmth, nutrition, protection from infection, safety and love.

- Prerequisite to early Breastfeeding
- Breast milk is life saving - high cost of milk formulae ,risk of diarrhoea
- In India - important way of maintaining mother's precious lactation.

Need for the study

- KMC- continuous - increase exclusive breastfeeding rates
- In spite of extensive lactation support, unable to express adequate milk
- Quantity hardly sufficient – donor mother's milk and dextrose
- Negative impact on the weight gain and duration of hospital stay
- Quantity of milk expression – not studied, intermittently
- *Propose - short duration KMC- improves volume of milk expressed immediately*

Aim

To evaluate the effect of Kangaroo mother care (KMC) on lactation of mothers of low birth weight infants in a tertiary care hospital

Objectives:

Primary:

- To compare the amount of milk expressed by mothers of low birth weight infants with and without giving KMC

Secondary:

- Duration of milk expression

Methodology

Study setting:

- Neonatal intensive care of a tertiary care hospital, Bangalore

Study duration:

- March - May 2012 - for a period of 3 months

Study design:

- A randomized controlled cross over study

Methodology

Inclusion Criteria:

Baby criteria : Babies admitted to NICU

- Birth wt <2500 grams - hemodynamically stable
- Age: 5-28 d on expressed breast milk

Mother criteria

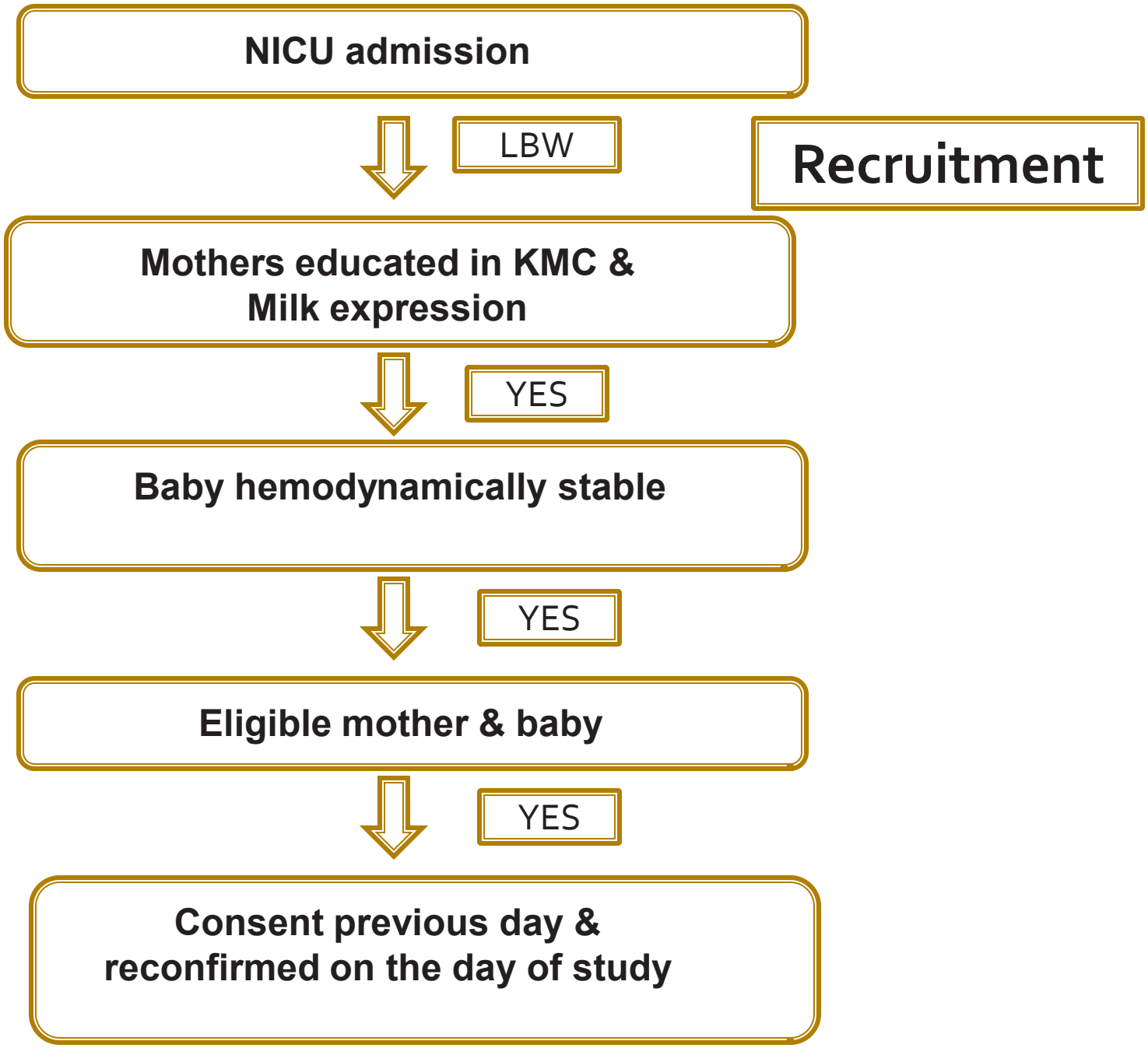
- Stable - Provided minimum two sittings of KMC prior the study
- Educated about KMC and aware of technique of milk expression

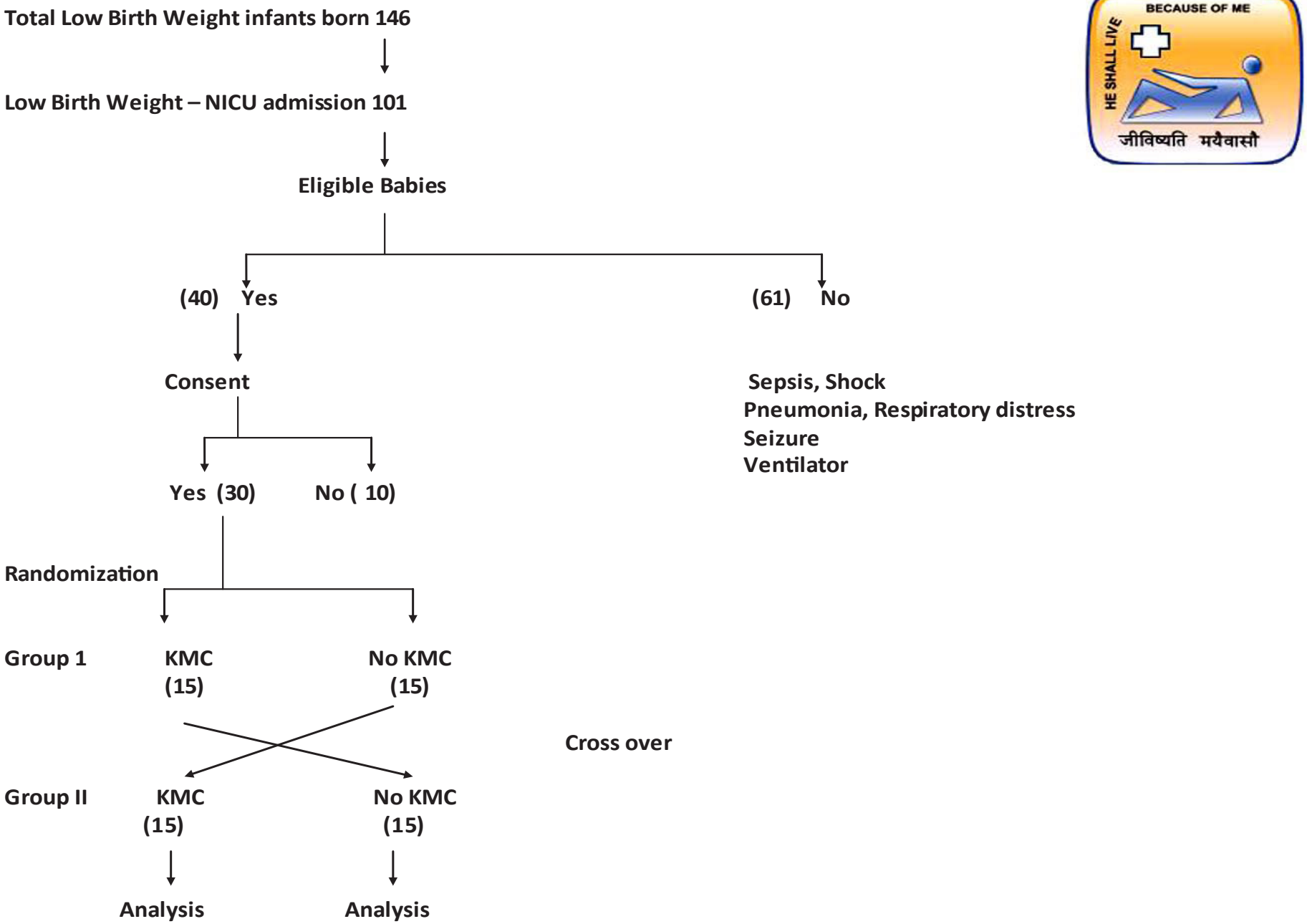
Exclusion Criteria: On the day of the study

- Unstable baby
- Unwell/stressed mother due to any reason

Sample size

- Pilot study- in our NICU
- Hypothesis testing for a difference between two means
  - Standard deviation group 1: 11.3
  - Standard deviation group 2: 11
  - Mean difference: 10% (0.1)
  - Type 1 error: 5%
  - Power: 90%
  - 1 / 2 sided: 2 sided
- Sample size: 27 in each group,
- No enrolled - 30 mother-baby dyads


NICU admission
LBW
Recruitment
Mothers educated in KMC &
Milk expression
YES
Baby hemodynamically stable
YES
Eligible mother & baby
YES
Consent previous day &
reconfirmed on the day of study


Total Low Birth Weight infants born 146
Low Birth Weight – NICU admission 101
Eligible Babies
(40) Yes
(61) No
Consent
Sepsis, Shock
Pneumonia, Respiratory distress
Seizure
Ventilator
Yes (30)
No (10)
Randomization
Group 1
KMC (15)
No KMC (15)
Cross over
Group II
KMC (15)
No KMC (15)
Analysis
Analysis

Methodology- Randomization

Randomization

- Only to determine the sequence of KMC/ NO KMC (gp-1/2)
- Each mother acted as her own control
- Randomization in blocks of ten using computer generated random no

Allocation concealment

- Groups in sequentially numbered opaque sealed envelopes

Mother giving KMC

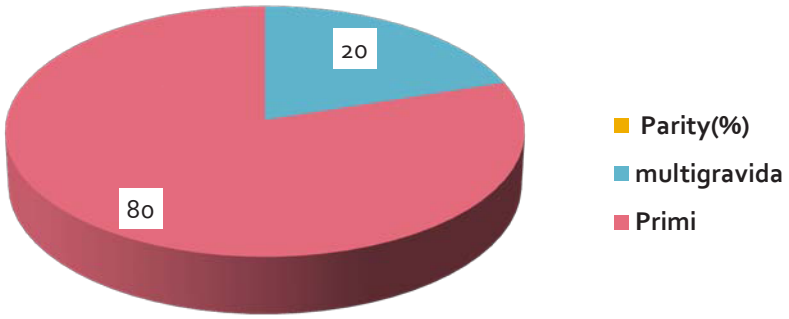
Statistical test

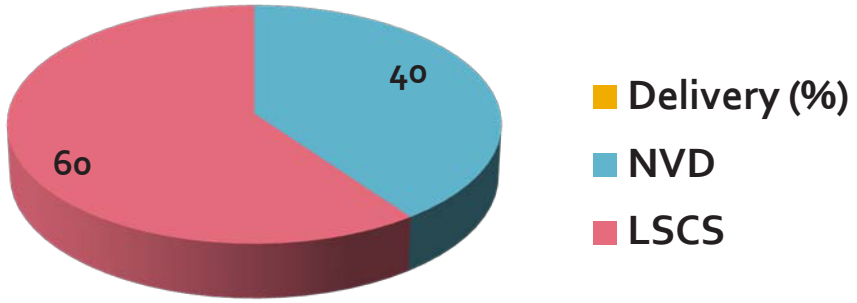
- Descriptive statistics
- Independent t test - group 1 and group 2
- Paired t test –quantitative analysis before and after KMC
- Mann-whitney- Quantitative bet 2 groups (not normal distribution)
- Repeated measures ANOVA- Factor (variable) is pattern of entry

Demographic details

Category	Total	Percentage
Mother /baby dyad	N= 30	
KMC/No KMC gp-1	N=15	
KMC/No KMC gp-2	N=15	
Normal delivery	14	40%
LSCS	16	60%
Primigravida	24	80%
Multigravida	6	20%

Demographic details



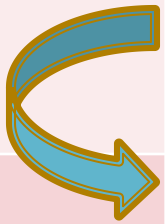


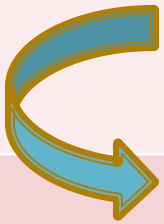
Analysis

Parameter	Mean (SD)	Median (IQR)	Min-Max
Mean birth Weight (gms)	1613.50, SD(433.6)	1645 (1287,1888)	830 To 2420
Mean gestation (wks)	33.53, SD (3.2)	33.5 (31.7,35.3)	28 to 40
Day of life at recruitment (days)	11.87, SD (7.6)	7 (6,19)	5 to28

Analysis

Independant –t test	Time 1 (1st sitting)	Time 2 (2nd sitting)
Group 1	KMC	No KMC
Group 2	No KMC	KMC





Analysis

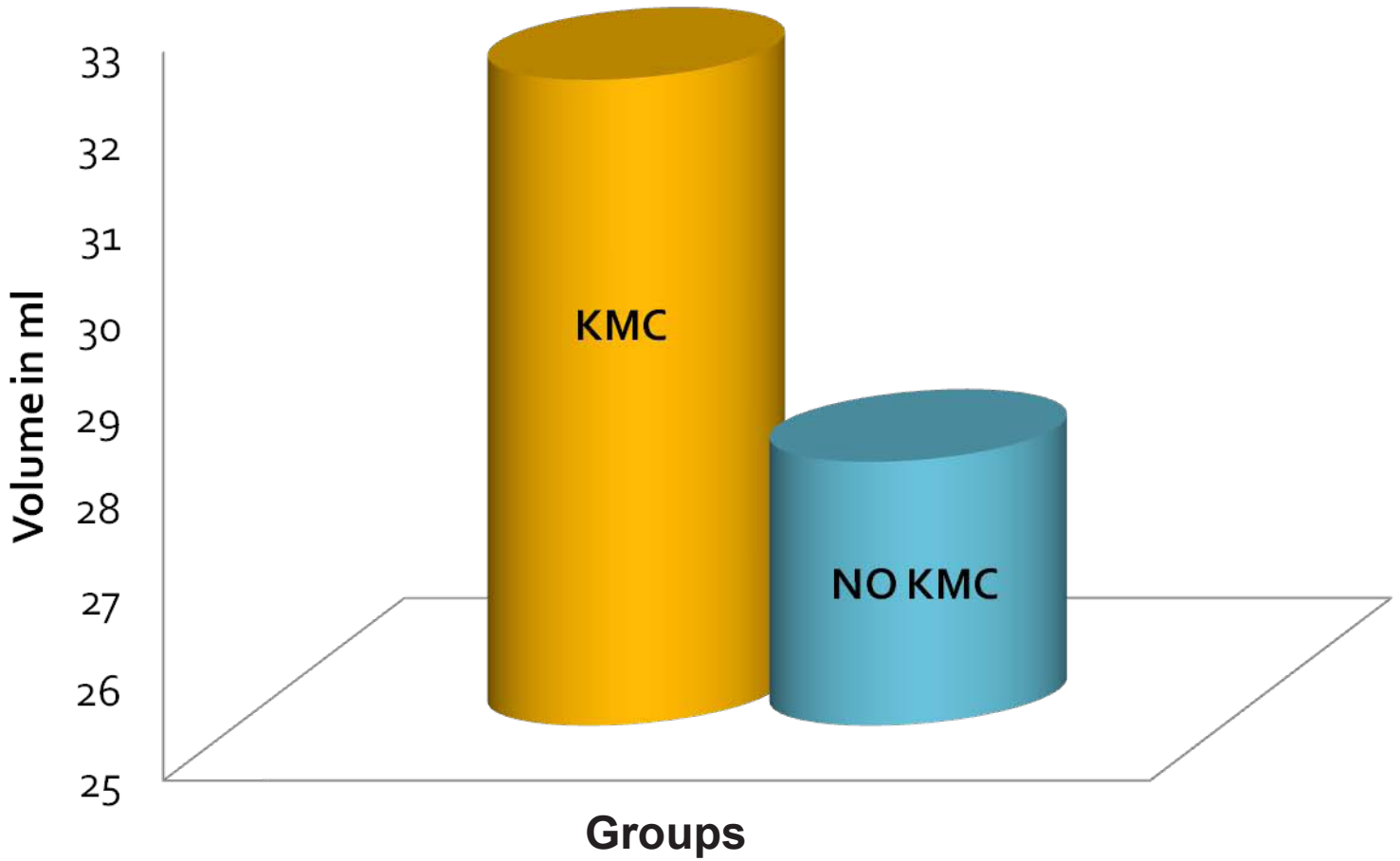
Paired t test	Time 1 (1st sitting)	Time 2 (2nd sitting)
Group 1	KMC	No KMC
Group 2	No KMC	KMC

	KMC (Mean ,SD)	NO KMC(Mean,Sd)	P Value
Volume expressed 1ST SITTING (ml)	29.53, SD(23.11)	29.87 (SD 17.4)	.917
Volume expressed 2ND SITTING(ml)	34.67, SD (21.602) 28, (27,37)	26.00 (SD 20.6) 24(16,25)	.010
Time taken 1ST SITTING (mins)	13.40 (SD 4.014)	15.20 (SD 4.916)	.281
Time taken 2ND SITTING (mins)	17.0 0 (SD 4.855) 17(13,20)	13.53 (SD3.543) 13(10,17)	.034

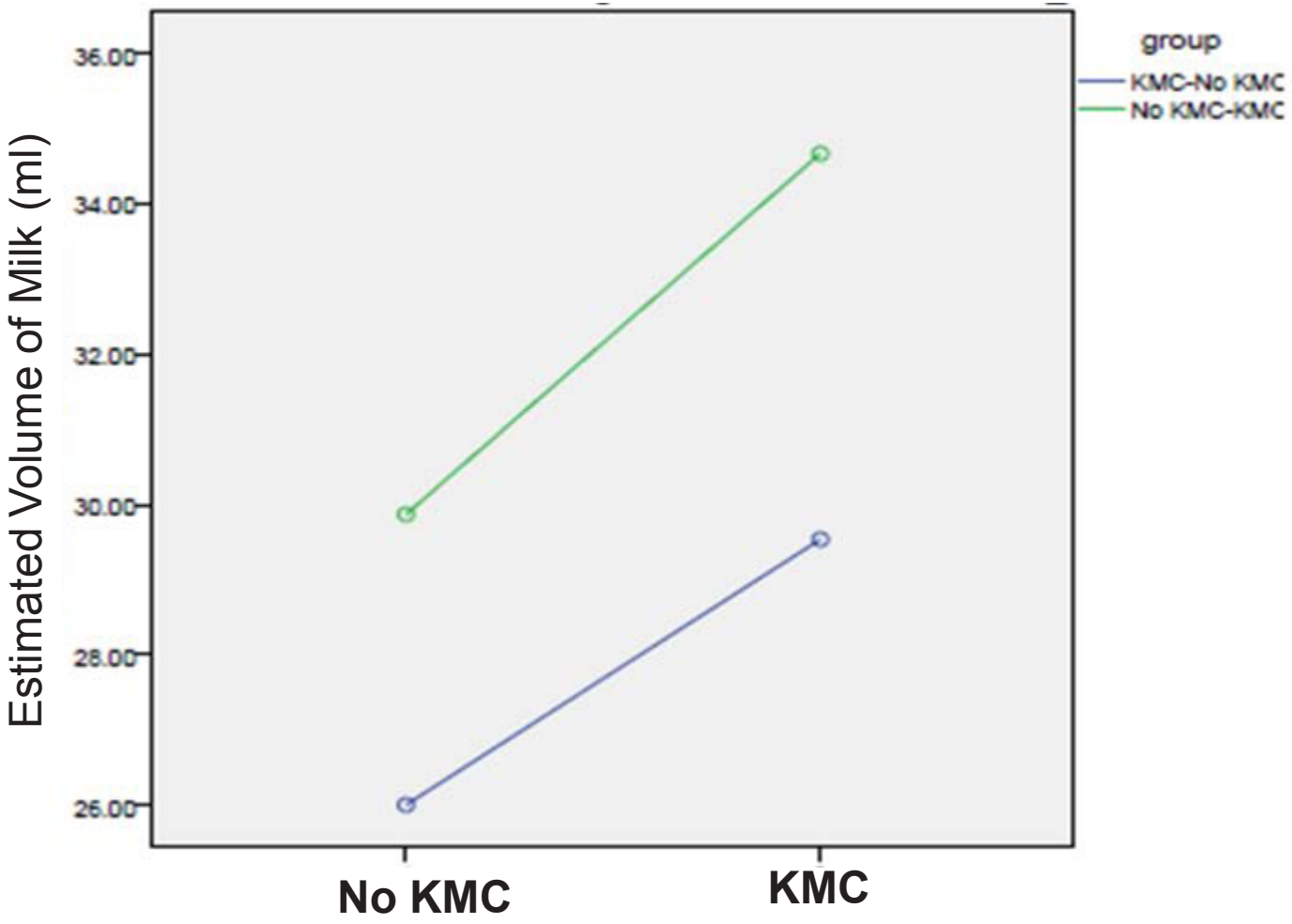
Multivariate Analysis

Parameter	Min-Max (mins)	Mean ,SD	
Volume in ml – No KMC	6-96	27.9 (18.8) 24.5 (19.7, 30)	<0.001
Volume in ml –KMC	7-107	32.1 (22.1) 28 (24, 35)	
Time of expression(NO KMC)	8-25	14.3 (4.3)	0.107
Time of expression (KMC)	7-25	15.2 (4.7)	

Multivariate Analysis



Volume of milk



	1	2	pattern (GROUP)	
Group 1	KMC	No KMC	KMC – NO KMC	AB
Group 2	No KMC	KMC	NO KMC - KMC	BA

REPEATED MEASURES ANOVA

- Method – KMC vs No KMC
- TIME EFFECT – Time 1 vs Time 2
- Group Ecffect(method X time)

Evidence ? KMC and breast feeding

- Prevalence,
- Duration of milk production
- Exclusive breastfeeding rate

Ramanathan K et al *Indian J Pediatr 2001*

- late initiation and practised only for limited time - benefit

KMC training module- AIIMS newdelhi

- Breast fed for a longer duration
- More no of feeds/day Vs non-Kangaroo

Deepti Kulkarni et al 2006

Ramanathan et al 2001

- The no of feeds /day increases

*veena Rani Parmar **et al** ,Indian J Pediatr 2009;*

Duration/ frequency of feeding

- Decrease probability of not exclusively breastfeeding at discharge (RR 0.41, 95% CI 0.25- 0.68).
- Duration ,number of feeds/day
- Stable milk production

meta-analysis Neonatal Review Group of the Cochrane

- Less time to reach full feed
- Early initiation of direct breastfeeding <1500 gm babies.

Deepa Banker et al , India

- Higher exclusive breastfeeding rates ($p<0.01$)

Syed Manazir Ali et al *UP, India*

- The total attachment score- 24.46±1.64 Vs 18.22±1.79, $p<0.001$

Kadam et al , Indian J Pediatr 2001

Breast milk volume

Year	Name of the author	KMC (ml) Vol Vs Control
1986	Schmidt E, and Wittreich G.	640 Vs 400 ml/ day
1993	Syfrett EB, Anderson GC	12 Vs 9 times/day
1997	Hurst NM et al (n=28)	647 Vs 530 ml/ day at 4 weeks
2010	Veena banker (n=200)	13 ml /day extra at discharge-P= <0.001

Exclusive breast feeding rates

Year	Name of the author	Exclusive breast feeding at discharge	Exclusive breast feeding at 6 weeks	at
2001	Ramanathan et al (Delhi) (N=28)		89.7 Vs 42.8% 12/14 Vs 6/14 P= <0.05	
2008	Rao suman (mumbi) (N=206)	98% vs76 at the end of the study		
2009	Syed Manazir Ali (UP) (N=114)	94.4% Vs 72.0% p=0.002 at 40 wks	89.6% Vs 62.2% p=0.002 @ 3 mo	84.6%, Vs 55.5% p=0.006)
2010	Veena banker (N=200)	95.96% Vs 64.95 P=0.002		
2o10	Udani et al (N=225)			95% @ 6 mo

Cochrane evidence-2011

Exclusive breast feeding

Discharge / 40 – 41 weeks'PMA

- (67.4%vs 56.8%; RR 1.21, 95% CI 1.08 to 1.36; *I*2 = 57%; n= 1197

1 - 3 mo

- 86.9% vs 76.5%; RR 1.20, 95% CI 1.01 to 1.43; *I*2 = 76%; n=600

- No statistically significant diff at 6-12 mo, onset of breastfeeding
- Intermittent KMC Positive effects on breastfeeding —

Cochrane evidence-2011

Any breastfeeding

- *Discharge or 40 - 41 wks' PMA*
- 88.4% vs 74.8%; RR 1.25, 95% CI 1.06 to 1.47; *I*2=84%;n=1440

1 - 2 months follow up

- 77.9% vs 67.9%; RR 1.33, 95% CI 1.00 to 1.78; *I*2 = 78%; n= 538

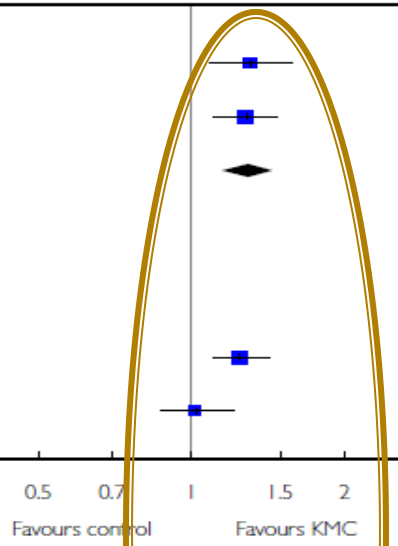
3 months follow up

- 79.7% vs 69.8%; RR 1.14, 95% CI 1.06 to 1.23; *I*2 = 41%; n= 924

- Heterogeneity (*I*2 > 50%) among trials reporting breastfeeding.

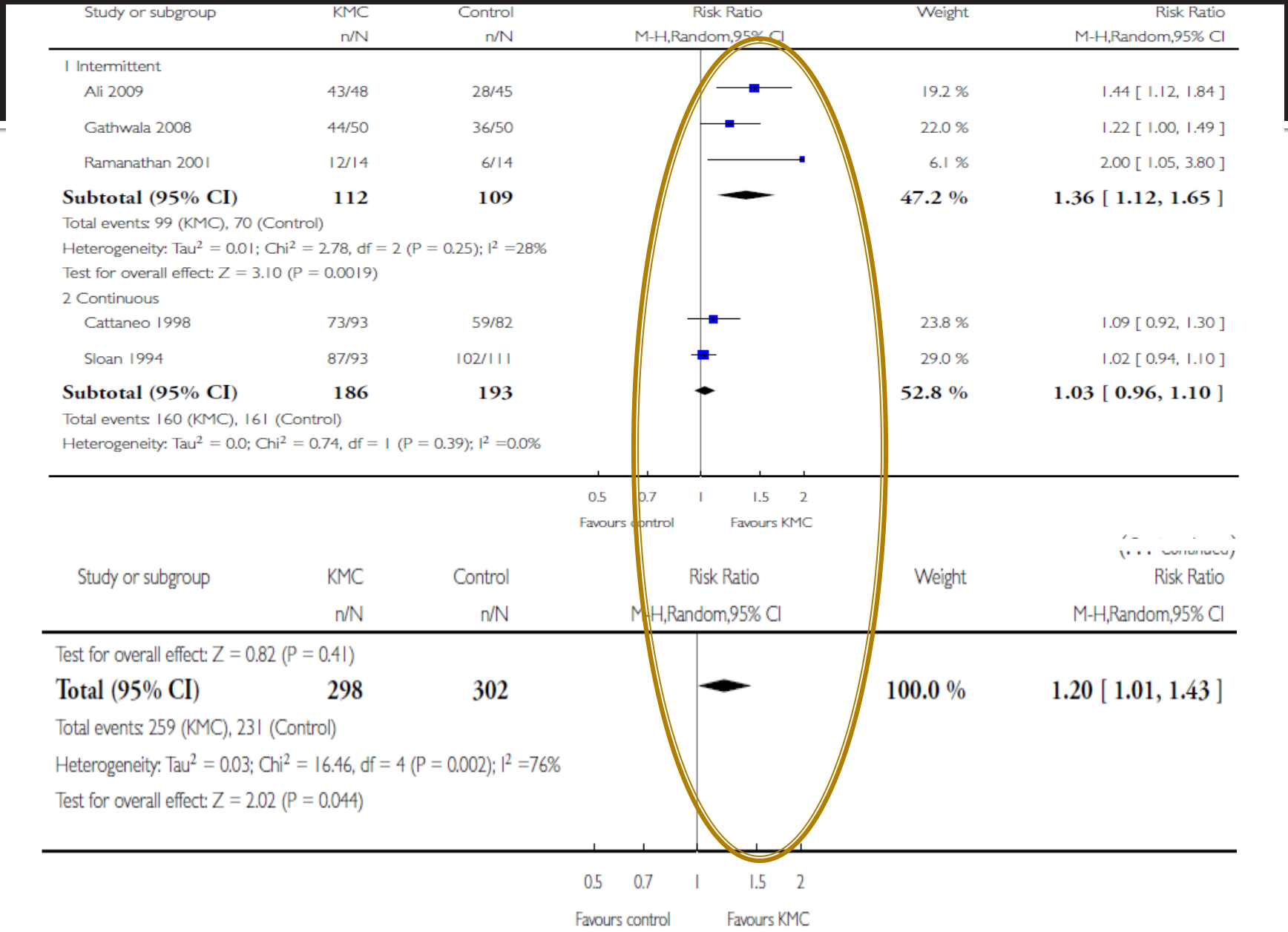
Exclusive breast feeding at discharge/40-41 postmenstrual age

Study or subgroup	KMC n/N	Control n/N	Risk Ratio M-H,Random,95% CI	Weight	Risk Ratio M-H,Random,95% CI
1 Intermittent					
Ali 2009	51/54	36/50		21.0 %	1.31 [1.09, 1.58]
Suman 2008	89/91	46/60		26.6 %	1.28 [1.11, 1.47]
Subtotal (95% CI)	**145**	**110**		**47.6 %**	**1.29 [1.15, 1.44]**
Total events: 140 (KMC), 82 (Control)					
Heterogeneity: $Tau^2 = 0.0$; $Chi^2 = 0.05$, df = 1 (P = 0.81); I^2 =0.0%					
Test for overall effect: Z = 4.40 (P = 0.000011)					
2 Continuous					
Cattaneo 1998	128/146	93/133		29.0 %	1.25 [1.10, 1.42]
Charpak 1997	159/343	145/320		23.4 %	1.02 [0.87, 1.21]
Subtotal (95% CI)	**489**	**453**		**52.4 %**	**1.14 [0.92, 1.42]**
Total events: 287 (KMC), 238 (Control)					
Heterogeneity: $Tau^2 = 0.02$; $Chi^2 = 4.35$, df = 1 (P = 0.04); I^2 =77%					
Test for overall effect: Z = 1.18 (P = 0.24)					
Total (95% CI)	**634**	**563**		**100.0 %**	**1.21 [1.08, 1.36]**
Total events: 427 (KMC), 320 (Control)					
Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 6.95$, df = 3 (P = 0.07); I^2 =57%					
Test for overall effect: Z = 3.24 (P = 0.0012)					



0.5 0.7 1 1.5 2
Favours control Favours KMC

Exclusive breast feeding at 1-3 mo age -stabilized



Summary

- Mean birth wt - 1613.50 grams
- Mean gestation - 33.53 weeks
- Amount expressed by KMC group was statistically significant (P= 0.001) as compared to no KMC group.
- The significant difference in amount was irrespective of whether they were randomized first to KMC or NO KMC

Conclusion

- Kangaroo mother care has a positive impact on the amount of milk expression
- There is a statistically significant increase in quantity of milk in mothers giving KMC

THANK YOU