



## Eye Care Practices and use of Surma in Newborns

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### Abstract

**Background:** We conducted this study to document the methods prevalent in our population for eyecare and use of Surma in neonates.

**Methods:** A 6-month study was done in Fatima Memorial Hospital, where mothers and female attendants of newborns were interviewed according to a formatted questionnaire, recording data about socio-demographics of participants, practices for eye care in newborns, and use of Surma.

**Results:** We interviewed 1425 females (mothers and attendants of newborns) in our hospital. Of participants, the mean age was 30 years, 33% were either illiterate or had not completed primary schooling, 73.4% were married, 49.5% were stay-home and 84.5% resided in Lahore. For eyecare after birth, 60% would use clean water, 18.9% had no knowledge, and 5.5% would use unsafe methods like antimicrobial agents. Medical personnel had guided females and families in 49%. Of the counselling by relatives (14.3%), grandmothers were a common influence. Majority (69.3%) of participants intended to use Surma, usually once a day, commonest reason being beautification of eyes and face. There was no correlation between initial eye care method, intention to use Surma, and socio-demographics.

**Conclusion:** We should educate our community and medical personnel, about safe eye care practices in neonates.

**Keywords:** Newborn Care; Eye Care; Surma; Kohl; Neonates

### Introduction

World Health Organization (WHO) has listed the eyecare as an integral part of essential newborn care (ENC) guidelines [1]. However, further details about the exact methodology are missing, apart from the advice to follow local guidelines. In many, especially developing countries, there are no official directives in this regard. At the individual hospital level, there are many guidelines, but none is established for general and community use.

In addition, use of Surma (also known in different parts of the world as Kajal, Kohl, al-kahal, tiro, or kwalli) is prevalent in Pakistan as well as in many other countries, cultures, and religions. It is used in newborns as well as in adults, both male and females, a common practice dating back to Egyptians pharaohs [2]. It is commonly used as a cosmetic (eyeliner) and additionally thought to improve vision and act as an antimicrobial agent for eyes and umbilicus of a newborn. However, in the last few decades, concerns have been raised about the adulterations in Surma and its high

lead content, a potential cause of lead toxicity [3-5].

In Pakistan, there are no guidelines for proper eye care in neonates and the Surma use is prevalent. We conducted this study, interviewing mothers as well as other females who participate in newborn care, to document the methods of eye care, frequency, and attitudes to the application of Surma in neonates in our population. It should help us devise culturally sensitive and evidence-based eye care practice guidelines.

### Material and Methods

A questionnaire-based cross-sectional study was done in Fatima Memorial Hospital, Lahore, Pakistan over 6 months (from July-2019 to December 2019). Doctors conducted interviews during rounds in the obstetric wards and neonatal OPD clinics. Mothers and female attendants of newborns were questioned according to a semi-structured questionnaire (both closed and open questions). The answers recorded data about socio-demographics of partici-

pants, attitude, and practices for eye care in newborns, use of Surma and source of their knowledge.

The team leader briefed participating doctors about the questionnaire at the start, followed by periodic group meetings to review the process. SPSS 22 was used for descriptive and inferential analysis. Chi-square test was used to identify any association between socio-demographic indices and attitudes towards eye care and Surma use.

Participants were not offered any monetary support for the interview.

**Results**

We interviewed 1425 mothers and attendants of newborn babies during the 6 months. The median age of participants was 30 years (IQR 10). The socio-demographic characteristics are shown in table 1.

Variable	Frequency (n)	Percentage (%)
Age		
20 or less	84	5.9
21-30 years	674	47.3
31-40 years	463	32.5
>40 years	204	14.3
Educational Status		
No formal Education	218	15.3
Up to 10 years of School	658	46.2
College or above	471	33
Doing or passed MBBS	78	5.5
Marital Status		
Unmarried	379	26.6
Married but no kid	79	5.5
Married and 1 <sup>st</sup> Kid	281	19.7
Married and 2 kids	433	30.4
Married and 3 or more kids	253	17.8
Residence		
Urban	1204	84.5
Villages	221	15.5
Occupation		
Housewife	706	49.5
Jobs	620	43.6
Completing Education	99	6.9

**Table 1:** Socio-Demographic Characteristics.

Most of the participants had been to school or college (79.2%) and another 5.5% were doing MBBS. Almost half of the participants (51.2% = unmarried, married with no kids and 1<sup>st</sup> time mothers) had answered reflecting their observation of practices at home. Half of our participants were stay-home mothers. Common jobs in the remaining 46% of females were doctors, teachers, nurses, bank officers, workers in super-markets, beauticians, and housemaids. Most of our interviewees came from Lahore (an urban area), the second-largest city in Pakistan.

Variable	Frequency (n) Total = 1425	Percentage (%)
Source of Knowledge about Eyecare		
Doctor	552	38.7
Nobody told/do not know	478	33.5
Relatives	204	14.3
Nurse or midwife	147	10.3
Read about it	44	3.1
First Cleaning of Eyes		
Water and cotton or cloth	855	60.0
Do not know	160	11.2
No need	110	7.7
Normal saline	72	5.1
Antibacterial drops	63	4.4
Rose water	59	4.1
Cloth or cotton only	37	2.6
Tissue wipes	23	1.6
Alcohol wipes	22	1.5
Polyfax eye ointment	16	1.1
Surma	8	0.6
Intention to Use Surma		
Yes	987	69.3
No	404	28.4
Do not know	34	2.4
Number of Surma Applications	(Out of 987 yes answers)	
1 time a day	534	37.5
2 times a day	316	22.2
3 or more times	137	9.6
Why use Surma (multiple answers)	(Total 3453)	
Beautifies eyes	1003	29.0
Improves vision	914	26.5
Makes eyes bigger in size	650	18.8
Prevents eye ailments	438	12.7
Keeps eye clean and safe	359	10.4
Prevents evil-eye	89	2.6

**Table 2:** Attitudes about Eye Care in Newborns.

Table 2 demonstrates the attitude of participants to eye care in newborns after birth. Commonest practise to clean eyes of baby after birth had been the use of water or normal saline with cloth or tissue wipes to clean eyes (60%). The second largest group (18.9%) either did not know about the appropriate method to clean eyes or thought it unimportant. However, 11.7% used unsafe materials to clean eyes such as antimicrobials (over the counter), rose water (poor quality control) and surma. Polyfax eye ointment, which was selected by 1% of females, is an antibacterial agent containing polymyxin sulphate and bacitracin zinc. Other antibiotic eye drops used contained gentamicin, tobramycin, or chloramphenicol.

Regarding eye care advice source, almost half of the females (49%) followed the advice of their family physicians or nurses (in delivery room or obstetric wards). About 33% said that nobody has counselled them regarding safe practices. Another 14.3% mentioned advices by relatives, of which, grandmothers especially maternal grandmothers were a common influence.

Two third of our participants intended to use or were using Surma, usually once a day, as shown in Table 2. The three most frequent causes for use of Surma had been the beautification of eyes and face, its ability to improve vision, and its role in making eyes bigger in size. These women thought surma to be safe and did not mention any side-effects. However, of the 30.8% participants, who do not apply surma, they were either unsure about its role or were afraid to apply anything to neonate’s eyes.

None of the females knew about the source of Surma, and all of them had acquired it from commercially available over the counter preparations. A few had bought kohl stone, ground it at home and mixed with vegetable oil. Kohl stone was often purchased from Makkah or Medina during Islamic pilgrimages by family members.

We calculated p-value for associations between the method of initial eye care (dividing into safe, unsafe or do not know categories) and surma use with age, address, marital status, parity, education, occupation, and personnel who taught them (Table 3). We did not find any significant correlation.

Parameters	How to Clean Eyes after Birth			P-Value	Surma Use			P -Value
	Do not know	Safe	Unsafe		Do not know	No	Yes	
Maternal Age								
20 or less	24	47	13	0.25	2	37	45	0.14
21-30 years	124	456	94		19	192	463	
31-40 years	80	309	74		10	114	339	
>40 years	42	138	24		3	61	140	
Maternal Education								
>5 years of education	157	516	110	0.49	21	240	522	0.06
Illiterate or <5 years of school	113	434	95		13	164	465	
Maternal Profession								
Housewife	149	462	95	0.10	17	197	492	0.93
Working women	121	488	110		17	207	495	
Marital Status and number of kids								
Married with 2 <sup>nd</sup> or more kids	130	457	99	0.99	18	192	476	0.82
Unmarried, married but no kid and 1 <sup>st</sup> kid	140	493	106		16	212	511	
Address								
Urban	224	805	175	0.72	32	347	825	0.16
Villages	46	145	30		2	57	162	
Who had told								
Medical person	120	482	97	0.28	13	216	470	0.14
Nobody/don't know	98	314	66		16	125	337	
Relatives and other	52	154	42		5	63	180	

Table 3: Correlations.

## Discussion

Eyecare immediately after birth is important but lacks literature about methods. Our study, to the best of the author's knowledge, is the only study from Pakistan that documents eye care practices and surma use in different socio-demographic sub-groups.

Another study from Pakistan showed a higher percentage (84%) would use water to clean eyes as compared to 70% (water, normal saline) in our study [6]. In our hospital, we recommend initial eyecare with clean water only.

We are especially concerned by the high incidence of over-the-counter use of different antimicrobial eye ointments or drops, in our study. Interestingly the antibiotic drops, or ointments were prescribed for one previous baby in the family, and it is being used for every baby. Use of these agents means the failure of proper counselling or guidance in an urban tertiary care centre. The parents and families should be discouraged strongly against the indiscriminate use of antibiotics.

The intention to use Surma by many participants is in line with established cultural traditions in Pakistan. However, Surma use in babies and females is prevalent in other countries as well, such as Saudi Arabia, the United Arab Emirates, other Arabic speaking countries, India, Bangladesh, Afghanistan, and some African countries.

Widespread use of surma, irrespective of age, marital status, parity, education, urban population, and occupation of participants, is likely based on cultural, religious, and family traditions. It has been propagated further, by close relatives, especially grandmothers. Such influence by close relatives is a fact, documented in other studies as well [7,8]. It underlies the need to counsel as many family members as possible, whenever there is an opportunity, regarding safe newborn care practices.

The lack of correlation of different sub-groups with eye care and surma use practices is important. It shows widespread and uniform culture and attitude across the population. Interestingly, during the discussions in the briefing sessions, many of the participating doctors were not aware of the origin, contents, or safety of available Surma products.

Original or traditional Surma contained antimony sulphide as an active ingredient, which has proven antimicrobial properties. However current surma products that are available in markets contain lead sulphide (ground galena stone) usually mixed with charcoal or vegetable ashes or oils [3,5,9]. Multiple studies across the world

have shown a wide disparity in lead content of the surma products, reporting as high as 85.5% in some instances [4,10]. Lead in the surma, likely does not enter system via eyes or conjunctiva, but from contamination of hands of an infant which are then taken to mouth. Over time, it leads to lead accumulation and development of chronic lead poisoning, presenting as lead line at gum margins, chronic anemia, headaches, constipation, sweating, irritability, colic, poor growth, abnormal IQ, and in severe cases, seizures, and death. The same has been shown to happen with maternal surma linking prolonged use with high lead levels in serum as well as in nails and cord blood in pregnant women [6,11,12]. All the studies, including ours, highlight the importance of public awareness for dangers of lead poisoning in relation to surma use.

Counselling for the use of clean water for initial eye care and discouraging other practices is straight forward. But establishing guidelines for surma use is complicated, since it is widespread, with roots in tradition, culture, and religion. One may argue for its occasional use. But it would need another study to check that if an occasional application (e.g., Once daily) of current surma products can cause lead toxicity or not.

## Conclusions

The general population, especially medical practitioners, mothers, and grandmothers should be counselled about safe eye care practices.

## Acknowledgements

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## Bibliography

1. World Health Organization, Department of Maternal N Child and Adolescent Health. "WHO recommendations on postnatal care of the mother and newborn" (2013).
2. Nutrition C for FS and A. "Kohl, Kajal, Al-Kahal, Surma, Tiro, Tozali, or Kwalli: By Any Name, Beware of Lead Poisoning". FDA (2020).
3. Hardy AD., *et al.* "A study of the composition of some eye cosmetics (kohls) used in the United Arab Emirates". *Journal of Ethnopharmacology* 80.2 (2002): 137-145.
4. Filella M., *et al.* "Kohl containing lead (and other toxic elements) is widely available in Europe". *Environmental Research* 187 (2020): 109658.
5. McMichael JR and Stoff BK. "Surma eye cosmetic in Afghanistan: a potential source of lead toxicity in children". *European Journal of Pediatrics* 177.2 (2019): 265-268.

6. Khan GN, *et al.* "A cross sectional study of newborn care practices in Gilgit, Pakistan". *Journal of Neonatal-Perinatal Medicine* 6.1 (2013): 69-76.
7. Sharma M and Kanani S. "Grandmothers' influence on child care". *Indian Journal of Pediatrics* 73.4 (2006): 295-298.
8. Almroth S, *et al.* "Unnecessary water supplementation for babies: grandmothers blame clinics". *Acta Paediatrica* 89.12 (2000): 1408-1413.
9. Al-Ashban RM, *et al.* "Kohl (surma): a toxic traditional eye cosmetic study in Saudi Arabia". *Public Health* 118.4 (2004): 292-298.
10. Pasha MA and Nallusamy B. "X-ray study of Kohl stone used in Indian traditional medicine and cosmetics". *International Journal of Ethnobiology and Ethnomedicine* 3.1 (2016).
11. Nir A, *et al.* "Is eye cosmetic a source of lead poisoning?" *Israel Journal of Medical Sciences* 28.7 (1992): 417-421.
12. Ikegami A, *et al.* "External lead contamination of women's nails by surma in Pakistan: Is the biomarker reliable?" *Environmental Pollution* 218 (2016): 723-727.

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