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"Kohl" Use for Infants

Luay Abdulla Muhiddin AL-Nouri, Saad Khalifa Khder

ABSTRACT:

BACKGROUND:

Kohl is still being used for the eyes of infants. The habit is of concern to paediatritians because of the serious toxic effects.

OBJECTIVES:

1.To determine how frequent kohl was being used for infants eyes, the reasons for its use and the method of application.

2. To estimate the blood and urine level of lead in infants, and in kohl samples from the local market.

3. To document kohl induced encephalopathy.

METHODS:

Mothers of 150 children under a year of age were interviewed and samples of 40 infants' blood and urine were analyzed for their lead content.

RESULTS:

Kohl was used for 47% of infants. Forty percent of town mothers and 57% of rural mothers were applying it to their infants eyes. Fifty percent of illiterate mothers and 33% of college graduates were applying it.

The habit started in the neonatal period: 40% of which on the third day after birth. The reasons for the use were: cosmetic 54%, improving vision 41% and prevention of eye infection 4%.

The mean blood and urine levels of lead were higher among kohl user, but it did not reach statistical significance. The lead contents of kohl samples varied from 0.4% to 54%. In two infants encephalitis was present, the most likely cause was kohl use.

CONCLUSION:

Kohl use is common during infancy. Its lead content could be high. I t was usually applied to the conjunctival side of the eyelid where a higher chance of absorption into the blood stream was expected. Kohl use for infants could lead to encephalopathy. Active means should be adopted to educate mothers about the hazards of kohl use for infants, and possibly banning the sales of lead containing kohl.

KEY WARDS: Kohl, lead, encephalopathy.

INTRODUCTION:

The kohl has been used in the middle east since the first century AD to darken eyelids , eye lashes and eye brows[1]. Kohl was used as a medicine for treatment and prevention of eye diseases among other uses. This was described by eminent physicians like Avicenna [2] and Ibn Al-Bittar[3].

Women are still commonly using it in Arab countries especially in rural and suburban districts and many are applying it to the eyes of infants.

Reports of toxicity to infants have been appearing in the medical literature for over two decades Reports of toxicity to infants have been appearing in the medical literature for over two decades [4].

The toxicity follows the use of brands that contain lead, especially lead sulphide. The three types available in our local market are " Hajjar Makka" , " Bint Ereef" and "Mahoo". They are applied to

In an attempt to reduce or eliminate this tox effect to infants we wanted to see how commonly is used , the reasons for its use , the way it applied and how often? .

Kohl samples obtained from the local market we analyzed for their lead content.

SUBJECTS AND METHODS:

Mothers of 150 children under one year of a were interviewed. They included 90 mothers children admitted to Al-Mansour Childr Hospital, Baghdad for various medical reasons a 60 mothers in Al-Kafa'a village near Bal attending a health centre, in the period from Mar to August 2001. Every other mother w interviewed.

Department of Paediatrics, Baghdad University

Blood samples for lead estimation were taken frc babies during an exchange or blood transfusion,

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avoid taking blood samples from otherwise healthy infants.

Twenty samples of blood 3ml each and twenty samples of urine 5ml each from kohl users, and the same number from non-kohl users transferred immediately to the Poisoning Consultation Centre, Medical City Hospital, Baghdad.

The analysis was done by atomic absorption spectrophotometeric technique [5]. Student T-test was used for statistical analysis. A P-value of less than o.o5 was considered the level of significance.

Nine samples of kohl from local market in Baghdad were analyzed at the National Nutrition Centre, Baghdad for their lead content. The atomic absorption spectrophotometric technique was used [5].

RESULTS:

Kohl was used for 70 infants (47%) of the 150 , 57% of girls and 43% of the boys. Of the mothers living in rural areas 57% used kohl for their infants and of the town dwellers 40% were using kohl for their infants. The mothers age varied from less than 20 years to over 40 years. Mothers of different educational levels were using kohl for babies starting from 50% of illiterates to 33% of the college graduates(Table 1).

The mother may start using kohl for the infant sometime during the first month after birth. Twenty percent started on the first day, but the maximum use was 40% on the third day when it was the habit of giving the baby the first bath(Fig 1).

The application was usually to the conjunctival side of the eyelid, and was done by the grandmother because of the mothers anxiety and lack of experience.

For almost one fifth of the infants the kohl was applied once a day. For about 17% , it was applied weekly and for 10% on alternate days . So with this frequent use the chance of absorption to the blood stream is likely to increase(Table 2). Ninety five percent of the mothers were persuaded by the infants grandmothers to apply kohl for them.

On asking mothers about the reason for the use of kohl for the baby: one half said that it makes the baby looks more beautiful, while about 40% thought it improves visual acuity, and a minority thought it prevents eye infection(Table 3).

An applicator was used for the baby alone 14% , while it was used by the mother in almost half and was 30% used by the grandmother(Table4). These applicators were not cleaned or sterilized except in a fifth of the applications. Seventy nine of the mothers were using kohl for their own eyes. Ninety one of these kohl users were breast feeding th babies. Breast milk lead could not be estimated f technical reasons.

The kohl powder was usually bought from the loc market by 85% of the mothers, the rest of the used to grind the kohl stones at home to prepare t powder.

The blood lead level was determined for twer babies for whose eyes kohl was used. It rang from 10 ug/dl to 156 ug/dl , the mean is 33,8. the babies for whom kohl was not used their blo lead level ranged between 12 and 26 ug/dl, t mean 19ug/dl. The urine lead content of kohl use was 65 to 310 ug/dl(mean 136ug/dl) , and 60 210 ug/dl (mean 139.8ug/dl) of the non-use However the difference was not statistical significant(Table 5).

DISCUSSION:

Kohl is in common use for babies in middle easte countries like Kuwait [4] , Oman[6], Saudi Arabia Palestine [8], and Iraq .

We found that it was used for almost half of t babies , often starting in the neonatal period , abo one fifth at birth , but the maximum number w on the third day after birth when babies usually g their first bath. The grandmother was usually t person who persuade the mother about its use, a she applies it for the first time herself, being mo experienced and confident. She usually applies it the conjunctival surface of the eyelid, as is t habit in Kuwait[4]. This habit is not confined to t less educated mothers and even college graduat were applying it to babies(Table 1).

The frequency of application varied from once twice , almost one forth each, to on weekly(17.1%), or even every other day(10% This may increase the chance of tox absorption(Table3).

The reason for kohl use for infants was in mo than half as a cosmetic. In the local market the are eyeliners prepared by cosmetic firms th contain no lead that may be used for such purpose , but are more expensive.

As for improving vision or prevention of e infection we are not aware of a scientific eviden for them. Interestingly enough these tv advantages of kohl were considered by emine physicians like Galen , Dioscoridis, Avicenna a Ibn-Albitar(2.3).

The kohl applicator was not confined to the use f the baby except in 14%, otherwise it was used the mother, grandmother or other adults(Table4). was only occasionally cleaned which may make a possible source of infection to the babi conjunctivae.

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Abdulaziz and Alkofahi found that more than 85% of unused or in-use samples of Al-kohl were contaminated with bacteria or fungi compared to 50% of the original stones , including coliform bacteria , staphylococcus spp. , pseudomonas spp. , P.vulgaris and S.marcescens.

The major hazard of kohl is its content of lead sulphide[4]. The lead content of the 9 samples of kohl obtained from the local market varied from 4% to 52%. In Kuwait the lead content of kohl in 13 samples were 45 – 88% [4]. In Haifa the content of lead in 6 samples analyzed were 17.3-79.5% [8]. In the Omani made kohl the main component was lead sulphide[6].

The effect of absorbed lead on the erythrocyte is by inhibition of the enzyme delta-aminolevolinic acid dehydrogenase which catalyses the formation of porphobilinogen ring , a key step in heme synthesis pathway. Another enzyme damaged by lead is ferrochelatase which catalyses the final step in heme synthesis , the insertion of iron in the protoporphyrin 1X ring and the resulting protoporphyrin accumulation in the erythrocytes, all this result in anemia[10].

The other effect of lead is on the nervous system. Peripheral neuritis is commoner in adults, acute encephalopathy is the more serious. It may or may not be preceded by behavioral changes, lead colic characterized by abdominal pain, occasional vomiting and constipation. Encephalitis features include persistent vomiting, ataxia, seizures, papilloedema, impaired consciousness and coma. If necessary for the diagnosis a spinal tap may be carefully performed [10].

Two of our infants had lead encephalopathy. The first was a nine month old girl who presented with fever, vomiting constipation, squint and pallor. She had a bulging fontanel and was comatose.

Seven out of 20 cases of encephalitis reported by Shaltout et al had bulging fontanels [11]. Her wrist radiogram showed a lead line. Her Hb was 8.2 grams/dl and the erythrocytes showed basophilic stippling. The cerebrospinal fluid showed increased protein but a normal cellularity. Her blood lead was 156 ug/dl and urinary lead was 230 ug/dl.

The second case was an 8 month old boy who presented with fever, vomiting and convulsions. His Hb was 9.7 gm/dl and his blood film showed basophilic stippling. The wrist radiogram revealed a lead line. The cerebrospinal fluid protein was raised, with normal cellularity. His blood lead level was 130 ug/dl and the urinary lead was 310 ug/dl.

In Shaltout et al study 18 out of 20 cases of lead encephatitis had anaemia of less than 10gm Hb/dl, 19 had basophilic stippling of erythrocytes and 19 had increased protein in the cerebrospinal flu Their blood lead ranged from 60 to 257ug/dl [4].

Children with lead poisoning who are not treat until they show signs of impending encephalopat have a 30-40 % risk of developing gross bra damage [11].

Previously a blood lead level of 20 ug/dl and mc was considered to be toxic. Recent evidence h shown that a level of 10 ug/dl of lead in blood m lead to deficit intellectual function, shortening attention span and increased risk of antisoc behaviour [12].

Neurobehavioral abnormalities demonstrated low level of lead exposure included low intelligence and poor school performance. A increase of blood lead from 10-20 ug/dl results average decrease of I.Q. of 2-3 points [10]. Le can readily cross the placenta and antena exposure appears especially hazardous[12].

A blood lead level of 20 ug/dl is an indication f intervention while a level of more than 100 ug/ may be associated with encephalopathy [12].

Nir et al assessing 24 kohl users and 30 non kc users aged 6-16 month found a mean lead level 11.2 ug/dl compared with 4.3 ug/dl in non users, less than 0.001. They also found that blood le was significantly higher in infants whose mothe used kohl (5.2 vs 2.8 ug/dl) P less than 0.02[8].

Other sources of lead poisoning in young childr are leaded gasoline, old paint , burning of batteri lead nipple shields, improperly glazed ceran containers[10]. Another source in the middle east inhalation of lead fumes(Bokhoor) a tribal practi in which pure pieces of lead are heated a immersed in water to generate fumes intended ward off evil, teething powder and kohl use for t umbilicus [4,7,11]. These causes were excluded history only as home visits were not possible. Jan , Al-Timimi ,and Abu-Timman in a study of schc children in Baghdad found a blood level of 10- ug/dl in 53% of them [13]. The use of lead gasoline in vehicles may explain the high lead lev in our controls.

Doctors should educate the parents of you children on the lack of any health benefit of kc for their children, and the potential toxic effect the health and life of children. They also have to told that there are eyeliners available for use that devoid of toxic substances. The mass mec especially the television can be a very useful tool health education [14].

CONCLUSION:

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Table(1): Mothers educational level

Educational level	Number	Kohl Users	% of users
Illiterate	10	5	50
Read and Write	25	7	28
Primary School	56	36	64
Intermediate School	30	9	30
Secondary School	17	9	53
College	12	4	33
Total	150	70	47

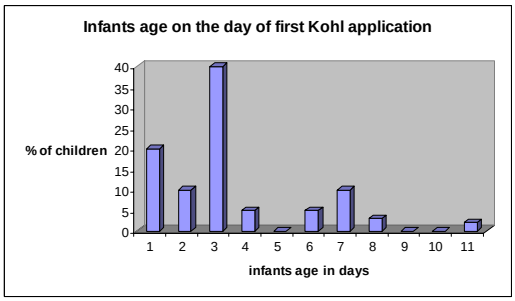

Fig. 1: Infants Age on the day of first Kohl application

Table(2) : Frequency of kohl use for infants

Frequency	No. of children	%
Once	16	22.9
Twice	16	22.9
Three times	12	17.1
Four times	7	10
Weekly	12	17.1
Alternate days	7	10
Total	70	100

Table(3): The reasons for kohl application on infants eyes

Reason	No. of children	%
Cosmetic	37	54.4
Improvement of vision	29	41.43
Prevention of eye infection	3	4.28
Total	70	100

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Table(4) : To whom the kohl applicator belongs

User	No. of children	%
Mother	36	51.4
Grandmother	21	30
Infant only	10	14.28
Others	3	4.28
Total	70	100

Table (5): Lead level in blood and urine

Specimen	Kohl users n=20	Non-users n=20	P-value
Blood lead ug/dl	10-156 Mean 33.8	12-26 Mean 19	P>0.1 Not significant
Urine lead ug/dl	65-310 Mean 136	60-210 Mean 139.8	P>0,8 Not significant

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