HELEN KELLER
INTERNATIONAL
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REPORT ON VITAMIN A SUPPLEMENTATION PROGRAMS

SUDAN

May 1985

SUDAN TRIP REPORT

Victoria M. Sheffield

May 14th - June 6th, 1985

I. PURPOSE

1. To work with the United Nations High Commissioner for Refugees (UNHCR) to monitor Helen Keller International's (HKI) shipment of megadose vitamin A to agencies working in the refugee camps and to provide training to health workers in these camps on the recognition, treatment and prevention of xerophthalmia.

2. In conjunction with UNICEF, to standardize vitamin A dose regimen guidelines for all agencies working with Sudanese people in both villages and displaced persons camps.

3. To determine the prevalence of vitamin A deficiency among Sudanese people in different areas of the Red Sea Province.

II. ACTIVITIES

A. Monitoring of Vitamin A Distribution and Training of Health Workers in Refugee Camps.

Visits to Wad Kowli, Wad Sherife, the Quirbas, and the Faus in eastern Sudan were made for the purposes of training health workers in xerophthalmia control and examining the eyes of children of different age groups for signs of xerophthalmia. A visit to the camp Aserni at El Geneina on the Chadian border for the same reasons was also made. Training sessions were conducted in each camp visited. HKI's treatment and prevention guidelines have been incorporated into training materials currently in use by the UNHCR and will be distributed to all the refugee camps. For information on the findings of the visits to these refugee camps, see Appendix I.

In both Khartoum and Gedaref, a number of health professionals with previous refugee experience with vitamin A deficiency reported that they had seen Bitot's spots, corneal ulcers, and corneal scars in adults in the refugee camps. Dr. David Heiden, a San

Francisco physician who spent three months at Wad Kowli said that he was particularly concerned about pregnant women with Bitot's spots, especially since these women were at high risk of measles, diarrhea and even cholera. The only vitamin A available to pregnant women in these camps comes in the form of one cup of fortified milk given daily. Lactating mothers were also seen with ocular signs of vitamin A deficiency.

Because of the concern expressed by these health professionals about vitamin A deficiency in adults, especially pregnant and lactating women, HKI was asked to send treatment and prevention guidelines for older patients. After conferring with HKI medical advisors, Doctors Alfred Sommer and Louis Pizzarello, Barbara Underwood, Ph.D., (specialist in biochemistry of vitamin A), and the HKI program staff, guidelines were written and telexed to UNHCR/Gedaref, for dissemination to the agencies doing health care. (Appendix II.)

HKI has been very concerned that its initial shipment of a half million doses of liquid vitamin A to Sudan reaches children at risk of nutritional blindness in refugee camps. The shipment left Switzerland in late March but notification of receipt was not made by the UNHCR for six weeks. Apparently, the shipment arrived on time in Khartoum, but delivery to the UNHCR was delayed by the general strike and the coup of April 6th. The vitamin A finally arrived at the UNHCR medical warehouse in Gedaref on April 28th and has been delivered to the camps in eastern Sudan through UNHCR.

The mechanism for dispensing liquid vitamin A to children was tested in the field. It was found that the syringe used to give one ml doses is messy and rather inaccurate for health workers to use since the liquid is thick and difficult to push through the syringe. HKI and F. Hoffmann - La Roche, are therefore designing a specific-dose pump mechanism which will attach to the lid thus eliminating the need for a syringe. Also, smaller bottles are more advisable as the 1250 ml cylinders are heavy and awkward to carry around. HKI is also investigating the possibility of using a sack with a shoulder strap. By incorporating these ideas from the field, HKI hopes to develop an

accurate, safe and practical delivery system for liquid vitamin A.

B. Standardization of Vitamin A Dose Regimen Guidelines and Training of UNICEF Personnel

With Mr. S. A. Farooq, Head of the Health and Nutrition Section and Mr. Yoshi Uramoto, Nutrition Officer at UNICEF, standardized guidelines on xerophthalmia, its treatment and prevention (Appendix III) were written. UNICEF will print 10,000 copies of these guidelines in English and Arabic for distribution to all agencies working with the Sudanese people. A training session on nutritional blindness and trachoma was held for the health and nutrition staff at UNICEF headquarters.

C. Assessment of Vitamin A Deficiency Among Sudanese Populations and Training of UNICEF Personnel

At the request of Mr. Egil Hagen, Head of UNICEF's Emergency Department, a visit was made to Omdurman, the vast displaced persons camp, located twenty minutes outside Khartoum, for the purpose of examining children's eyes for signs of xerophthalmia. Approximately 53,000 Sudanese nationals are presently living there. Among the 124 children seen, 12.1% had conjunctival xerosis and 3.2% had Bitot's spots. (Appendix IV.) The results of this visit encouraged the authorities to allow UNICEF and private voluntary agencies to establish health services and facilities in the camps where previously no services were permitted.

From May 14th - 24th, at the request of UNICEF, HKI consultant Dr. H.S. Chana and the author performed a xerophthalmia prevalence survey in the Red Sea Province looking at children in areas north and south of Port Sudan. The rates of xerophthalmia vary mainly due to standard of living differences. Logistics proved to be a major obstacle in the assessment as most people live in one and two family settlements many kilometers apart, and most desert trails in the north are impassable by vehicle necessitating the use of camels. (Appendix V.)

Brief discussions were held with Mr. Robert P. Gersony of the U. S. Embassy and Mr. Kurt Fuller of

USAID regarding HKI's assessment, and vitamin A/ training activities in the Sudan to date. For an overview of the Sudanese health care infrastructure, see Appendix VI.

III. RECOMMENDATIONS

1. HKI should continue its delivery of vitamin A to the UNHCR for distribution to agencies working in the relief camps, until natural sources of vitamin A such as green leafy vegetables, yellow fruits and milk are available. The UNHCR's warehouse and transport facilities are well organized at this time.

2. HKI, with Hoffmann - La Roche, should continue to develop and field test a safe and effective dose mechanism for the liquid vitamin A.

3. In the next few months, HKI should send a field representative to the Sudan to work with UNICEF, the MOH and the UNHCR to follow-up on vitamin A assessment needs, delivery and training. With over 30 refugee camps in the east alone and with the Sudanese population increasingly at risk of vitamin A deficiency, a full-time field representative is needed to coordinate activities with the many agencies working there.

4. The severe malnourishment of people in both the refugee and displaced persons camps and the inavailability of foods rich in vitamin A necessitate continued programmatic support, assessment and evaluation. Formal surveys, including serum vitamin A levels, need to be conducted to answer the many questions raised by the unprecedented findings of xerophthalmia in adults. Treatment doses for adults must be revised and tested for efficacy and safety. The complexity of the situation in Sudan and the diversity of its populations (Ethiopian and Chadian refugees, urban and nomadic Sudanese populations with wide ranging cultural differences) present unique challenges, as well as opportunities, for operational research.

IV. Personnel and Contacts

United Nations High Commission for Refugees (UNHCR)

Rob Robinson, Khartoum	Project Officer for East
Herman Struuwold, Khartoum	Project Officer for West
Graham Sale, Khartoum	Head, Medical Store House
Mike Menning, Showak	Head, Sub-Office, Gedaref/Showak
Richard Nesbit, M.D., Gedaref/Showak	Chief Medical Officer
Angela Berry, Gedaref/Showak	Chief Nutritionist
Jason Weisfeld, M.D., Gedaref/Showak	Centers for Disease Control (CDC)/USA - Consultant
Margaret Fyfe, R.N., Gedaref/Showak	Community Health Advisor, Home Visitor and TBA Program
Jean Meyer, R.N., M.P.H., Gedaref/Showak	Community Health Advisor, Home Visitor and TBA Program
Gesche M. Karrenbrock, Port Sudan	Head Sub-Office, Port Sudan
Ekber Menemencioglu, El Geneina	Public Information Officer
Abib Kamil, El Geneina	Assistant Field Officer

Commission for Refugees (COR) - Sudan

Ambassador Abdel Magid Bashir Elahmadi, Khartoum	Commissioner for Refugees, Ministry of Internal Affairs

Mr. Hassan Attiya Musa, Khartoum	Director for Planning and Implement Affairs of Projects. Office of the Commissioner for Refugees
Fadil Hamid Diyab, Showak	Acting General Project Manager - East
Dr. Mohamed Ibrahim, Gedaref/Showak	Chief Pharmacist

United Nations Children's Fund (UNICEF)

Dr. Samir Basta, Khartoum	Country Representative
Tony Carter, Khartoum	Program Officer for Statistics and Planning
Egil Hagen, Khartoum	Chief, Emergency Department
S. A. Farooq, Khartoum	Chief, Health and Nutrition Section
Saadia Idris	Assistant Program Officer for Health
Yoshi Uramoto, Khartoum	Nutrition Officer
Ihsan Mustafa, Khartoum	Assistant Nutrition Officer
S. S. Gurung, Khartoum	Supply/Logistics Officer - Health
Ian Pett, Port Sudan	Head, Port Sudan Office
Mohamed Tahir Hamed, Port Sudan	Project Manager, Joint Nutrition Support Project (JNSP)
S. Fida Hussain, Port Sudan	Project Officer, JNSP

United States Agency for International Development (USAID)

Kurt Fuller, Khartoum	Assistant Agricultural Development Officer
Dr. Ali Biely	Primary Health Care Advisor

United States Embassy

Robert P. Gersony	Humanitarian Assistance Officer

Ministry of Health - Port Sudan

Dr. Ali Salam Dem Medene	Port Sudan Hospital, Anesthetist/Pediatrician

Oxfam/UK

Nicholas Weiner, Khartoum

Tim Foster, Port Sudan

John Morton, Port Sudan

Chris Wigglesworth, Showak

Karen Twining, El Fasher

Ann Dalrymple-Smith, R.N., El Geneina

Save the Children/UK

Andrew Timson, Khartoum

Andrew Cowley, El Geneina

APPENDIX I

REPORT OF VISITS TO REFUGEE CAMPS IN EASTERN AND WESTERN SUDAN

Prevalence of Xerophthalmia at Wad Kowli Refugee Camp
Eastern Sudan - May 26th, 1985 - Victoria M. Sheffield, COMT.

Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar
104	6 (5.7%)	11 (10.6%)	1 (1.0%)	3 (2.9%)

These 104 people were not being fed in either Therapeutic or Supplementary Feeding Centers, but rather in just general feeding.

Three with Bitot's spots were approximately 20 year old lactating mothers.
One 18 year old male had a phthisical right eye and Bitot's spots and a corneal scar in his left eye.

Wad Kowli is a camp of approximately 25,000 Tigranean refugees. These refugees started returning to Tigray from Wad Kowli in large numbers in the middle of May when they heard that it was raining there. Some 20,000 have already left.

SCF/UK provides medical care. I spoke with Fran Leslie, M.D. and Kate Gardner, RN who is in charge of training. Children below 75% Harvard Standard are in Therapeutic Feeding and those 75% to 80% are in Supplementary Feeding until they maintain 80% for one month before being discharged.

Since January, all children received 200,000 IU vitamin A capsule upon registration. Those in Therapeutic and Supplementary Feeding receive one 200,000 IU capsule at the feeding tent and another capsule one week later. I saw one male child one year old in Therapeutic Feeding with keratomalacia, right eye after receiving a treatment regimen of vitamin A. The malnutrition and assaults from measles and diarrheal diseases are so severe that more than one treatment regimen of vitamin A is required.

When people at Wad Kowli are moved to Quirba Central or Quirba South to more organized facilities, all children will be given a dose of 200,000 IU vitamin A upon departure.

Prevalence of Xerophthalmia at Wad Sherife Refugee Camp, Eastern Sudan - May 28th, 1985.

Children up to age 15 years - Victoria M. Sheffield, COMT.

	Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar
Therapeutic Feeding LARC*	115	15 (13.0%)	5 (4.3%)	0	0
Supplemental Feeding LARC*	100	9 (9.0%)	5 (5.0%)	1 (1.0%)	2 (2.0%)
Totals	215	24 (11.2%)	10 (4.7%)	1 (0.5%)	2 (0.9%)

The staff assumes that all of these children received at least one dose of 200,000 IU vitamin A and had been vaccinated against measles.

Wad Sherife is a camp approximately 20 minutes outside Kassala with a population of Eritrean refugees. The closest Ethiopian border point is four kilometers and it is 10 kilometers to the checkpoint on the road.

Tigraneans are also in the camp and now, Hausa speaking people who are Nigerian descendants living around Kassala are moving into the camp to get food. The camp at the time of my visit was in chaos as far as registration is concerned. People pick up and move their shelters daily to reregister in order to get more rations. To stop this, the COR stopped registering new people for one month. This caused additional hardship for the severely ill people who now have to wait longer for care. The population is now estimated at 140,000, but LARC representatives believe it is only 80,000 to 90,000 because of the double and triple registering.

Health care is provided by LARC and the Swiss Red Cross and they say that they are seeing diseases not expected in adults such as xerophthalmia, scurvey, measles (among the nomads), and chicken pox.

It is difficult to assess the mortality because of the constant movement of the refugees, but also because adults are often buried quietly and not reported so as to keep the ration cards active. Also, many people do not name their newborn boys until they are 40 days old and girls until they are 80 days old. If the children die, they are not buried in consecrated graves and are not recorded as having died.

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* - "Lelamba/American Refugee Committee"

The people at Wad Sherife are currently being moved to the camp at Qirba North further south. From there, they will be repatriated to Ethiopia.

LARC
Sr. Terry Shields, RN, Nurse Midwife
Sue Smith, RN
P.O. Box 238
Kassala

Swiss Red Cross
Joe Carera, M.D.
Michelle Chollet, RN

At present, it is logistical impossible to implement a vitamin A prophylaxis program at Wad Sherife until the people stop moving, are registered and supervised, and more manpower is available.

Prevalence of Xerophthalmia at Quirba Central, Eastern Sudan - May 30th, 1985.

Pregnant and lactating women and Ethiopian health workers - Victoria M. Sheffield, COMT.

	Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar
Lactating Women in Therapeutic Feeding	17	2	1	0	4
Lactating Women in General Population	46	2	8	0	1
Pregnant Women in General Population	5	0	3	0	0
Health Workers	14	4	2	0	0

A fourth pregnant woman complained of recent onset of night blindness.

Quirba Central is one of three camps outside Kashm el Quirba about three hours south of Kassala. It is run by CO, CAA, and LRCS. The present population is 19,500 and decreasing as people are being repatriated to Ethiopia. They are Tigraneans who were moved to Quirba Central from Wad Kowli. I was told that all of the children received a dose of 200,000 IU vitamin A upon leaving Wad Kowli. Quirba North is about one kilometer away and has a population of 11,000 Eritreans who were moved from Wad Sherife. Quirba South is not yet open, but will house Tigraneans who will be moved from Wad Kowli.

At present, there is approximately one home visitor to every 300 people in these camps which is considered to be a very good ration. One to 500 is desired by the UNHCR. Except for the lactating mothers being fed daily in Therapeutic Feeding, pregnant and lactating women gather every seventh day for high-energy milk fortified with vitamins A and D, high-energy biscuits, and weight check. The dry rations consist of dry skim milk and corn soya milk, sugar and oil which is made into Uganda supplementary porridge mix described in the Oxfam Feeding Book. Home visitors check to see that women prepare the rations properly.

Contacts:

Christian Outreach (CO)	Christian Aid Abroad (CAA)	CONCERN	LRCS
Claire Elcomb, Nutritionist	Chris Chevalier, RN	Margaret Fitzpatrick, RN	Tuire Blad, RN, Midwife
Ruth Ashe, RN	Lynn Bestic, RN		Kayomi Tsukamoto, Comm'ty Health Ns
Rose Shimwell, RN			
Fiona Cunningham, RN			

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Prevalence of Xerophthalmia at Fau 3 Refugee Camp, Eastern Sudan - June 1st, 1985.

Children up to age 15 years - Victoria M. Sheffield, COMT.

	Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar
Therapeutic Feeding - IRC	44	0	2	0	1
Supplementary Feeding - CARE	88	5 (5.7%)	10 (11.4%)	4 (4.5%)	2 (2.3%)
Adults seen in Supplementary Feeding - CARE	14	0	1	2	0

The three camps at Fau are controlled, live-in tented camps along a large canal built with USAID funding. The refugees are from Eritrea and Tigray and many are now being repatriated by the UNHCR.

In the IRC's Therapeutic Feeding tent, I was impressed at how well the childrens eyes looked at first glance. Most had been given two doses of 200,000 IU vitamin A within the last two weeks. The childrens index fingers were dipped in gentian violet which remains for a week or so in order to mark those who had received vitamin A. It is food for thought that perhaps two doses are more appropriate for prevention because of the depletion of the childrens vitamin A stores and the prevalence of diarrheal diseases and measles. This would be a consideration during further formal studies including serum vitamin A levels.

Prevalence of Xerophthalmia in Aserni Refugee Camp, El Geneina, Western Sudan - June 3rd, 1985.

Children up to age 15 years - Victoria M. Sheffield, COMT.

	Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar
Abetchi Bergu Tribe (outside camp - waiting to be registered)	28	3	1	0	1
Abetchi Bergu Tribe (inside camp - registered)	43	4	0	0	3
Normad Zagat Arabs (camel nomads - registered)	42	3	0	0	0
Dudjo Tribe (cross-border tribe, mostly Chadians from Gosbada - registered)	45	4	0	0	1
Totals	158	14 (8.9%)	1 (0.6%)	0	5 (3.1%)

The Aserni Camp is approximately 45 minutes from the town of El Geneina and has an official population of 53,000 although the UNHCR staff feel it is only about 30,000. Most are women and children and are members of nomadic cross-border tribes. The Massalit is the original ethnic group and the are was called Dar Massalit before being divided by the French in 1913 and the British in 1922 leaving the existing border between Chad and the Sudan.

There are 3.2 million people in the west of the Sudan. It is estimated that there are 400,000 internally displaced people within Darfur Province. About 1/3 (120,000) including those in camps are refugees and all are Muslims. Food aid to people in the Geneina area is based on the 1983 census which has resulted in aid being only 40% of what is needed because the population has swelled with people who have moved down from Northern Darfur and refugees. This has caused food riots in some towns since April. Also, when nomads try to enter some of the towns, they are attacked. There have been isolated cases of supply trucks being raided on the road. All this expresses the severity of the famine and the difficulties caused by limited supplies of food getting through.

The average rainfall should be approximately 430mm per year. Last year, it was only 100mm. If the expected rains come in July, the roads will become impassable and the few trucks now transporting grain will not be able to get through. Only one train gets to Nyala (end of the line) every two days. At the time of my visit, there were food stocks to last only until the end of June. It had been hoped that buffer stocks could have been stored to last through October, but this is not the case. Mr. Menemen-

cioglu was in the process of moving the people by truck from the Aserni camp 168 kms. south to a camp at Ummbola which is accessible to truck traffic and supplies.

In the camps, the refugees get water and some food. However, in some camps, people are getting only 3-38 grams of food per day when they should be getting 500 grams per day. CARE distributes food in Kordofan Province and SCF/UK has taken on this responsibility for Darfur Province. Beans and maize are present but EEC stocks of DSM have not yet arrived but are promised. Mangos, an excellent source of vitamin A, are in season, but are too expensive for people in the camps. Half of the menfolk have left the northern areas to move their few remaining camels to areas with water and leafy vegetables.

The cross-border nomads remaining in the western areas of Darfur have learned to scavenge for food. They can raid an anthill every couple of days and retrieve up to a kilo and a half of dura. Also, they eat the green leaves of the lolob bush. They boil the poisonous mukhet berries (known as "famine food") for 8-10 days to remove toxins, but they still give children diarrhea.* Oxfam is currently analyzing the nutritional value of the mukhet berry.

Presently, the German Emergency Doctors are providing medical care at Aserni. They report that they do trichiasis/entropion operations for trachoma, however, xerophthalmia is not a major problem at this time. At present, there is no outreach at Aserni such as the home visitor/TBA programs at the camps in eastern Sudan.

I did not have the opportunity (because of time constraints) to visit the other camps at Angi Koti, Foro Burunga, or Disa (El Geneina). Logistics and communications are an extreme hardship compared to eastern Sudan USAID is investigating the possibility of transporting grain by truck (local hire) over the northern route through El Fasher. The UNHCR, SCF/UK and Oxfam staff in the west feel a great sense of urgency and impending disaster because of the inability to get enough food aid out to the west as needed.

Even though xerophthalmia is not reported as a major problem in the west at the present time, the nutritional status of the people will deteriorate rapidly as food runs out. Also, much of the land where the survival food has been growing is now bare. Surveillance of this situation is needed to monitor the prevalence and incidence of xerophthalmia in order to see that needed vitamin A is sent to the agencies in the west when requested.

*McLean, Malcolm, Oxfam Nutrition Officer, "A Report on the Nutritional Status of 1,888 Children in Kordofan", Oxfam/UNICEF, February/March 1985.

APPENDIX II

ADDITIONAL GUIDELINES

Additional guidelines:

TREATMENT for patients over age 15 (fifteen) years with signs of xerophthalmia or measles:

1. Pregnant women:

   Give vitamin A 10,000 (ten thousand) IU daily until delivery. Immediately after delivery, give one 200,000 (two hundred thousand) IU capsule or liquid.

2. Lactating women and women of child-bearing age:

   Give 10,000 (ten thousand) IU daily until xerophthalmia or measles go away. Discontinue treatment after 40 (forty) days.

3. Adult males:

   Immediately - one 200,000 IU capsule or liquid
   Following Day - one 200,000 IU capsule or liquid
   One Week Later - one 200,000 IU capsule or liquid

PREVENTION:

1. Guidelines of 10,000 (ten thousand) IU daily for all pregnant women until delivery as per WHO 1982 publication should remain as written. Do not give doses of vitamin A higher than 10,000 (ten thousand) IU per day.

   One 200,000 (two hundred thousand) IU capsule or liquid should be given within one month after delivery.

2. It is not advised to mass dose all adults prophylactically at this time.

APPENDIX III

UNICEF GUIDELINES

Guidelines for Prevention of Blindness in Sudan

Due to Vitamin A Deficiency (Xerophthalmia)

A. Xerophthalmia means:

drying of the conjunctiva and cornea followed by destruction of the cornea and blindness. This is due to lack of foods rich in Vitamin A.

B. Important:

1. Xerophthalmia causes blindness in children under the age of 10 years.
2. Xerophthalmia can cause destruction of the cornea and blindness in 48 hours if not treated.

C. Risk Factors:

1. The diet in the area is not varied. There are few foods rich in Vitamin A such as:
   a. milk and milk products.
   b. green leafy vegetables: girgir, molokhia, bamia.
   c. Yellow fruits and vegetables: papaya, mango, pumpkin, tomatoes, chillies, carrots.
2. Children who are affected by epidemics such as measles and/or diarrhea.
3. Areas where environmental changes such as drought have removed the sources of Vitamin A foods:
   a. cows' milk dries up.
   b. failure of garden crops.
4. Families with more than 2 children under age 5 years.

D. Signs and Symptoms of Xerophthalmia:

1. Bitot's spots: foamy or cheesy white patches on the white part of the eye.
2. Conjunctival xerosis: dry wrinkled conjunctiva.
3. Corneal xerosis/ulceration: dry, ulcerated cornea.
4. Keratomalacia: wasting or "melting" of the cornea.
5. Corneal scar: white scar on the cornea.

E. Doses:

There are two ways to dose Vitamin A. One is for treatment, another for prevention.

Treatment

For children with signs and symptoms of xerophthalmia and/or measles, give 200,000 International Units (IU) Vitamin A capsule or liquid.

1. Immediately - one 200,000 IU Vitamin A capsule or liquid.
2. Following Day - one 200,000 IU Vitamin A capsule or liquid.
3. One Week Later - one 200,000 IU Vitamin A capsule or liquid.

Vitamin A is safe if used as directed.

Prevention

All children up to age 15 years, give 200,000 IU Vitamin A capsule or liquid once every 3 months.

UNICEF/Sudan May 1985
Helen Keller International

كيفية استعمال فيتامين (أ) للوقاية والعلاج

الغشاوه (العمى) فى السودان

أ ـ معنى الغشاوه (العمش)

هى عباره عن جفاف فى الملتحمه وتقرح فى القرنيه يليه العمى الليلى الناتج عن نقص فيتامين (أ) ٠

ب ـ تنبيـــه

(١) تسبب نقص فيتامين أ الغشاوه والعمى الليلى للاطفال مادون سن العاشره ٠
(٢) يمكن أن يؤدى نقص الفيتامين "أ" الى تحطيم القرنيه والعمى فى ظرف ٤٨ ساعه اذا لم يتم علاجه ٠

جـ الفئات المعرضه له

١ـ المناطق التى لايوجد فيها تنوع فى الاطعمه ٠ الاطعمه التى تحتوى على فيتامين "أ" تحليله وذلك مثل
أ ـ اللبن ومشتاته ٠
ب ـ الخضروات الداكنه الخضره مثل الملوخيه والجرجير والباميه ٠
ج ـ الفواكه والخضروات الصفراء مثل المانقو والباباى والقرع والطماطم ٠
٢ـ الاطفال المصابين بالامراض الوبائيه مثل الحصبه والاسهال ٠
٣ـ المناطق التى تتعرض للتغيرات البيئيه مثل الجفاف والتصحر والتى تقضى على مصادر فيتامين "أ" كالاتى ـ
أ ـ يجف اللبن فى الابقار ٠
ب ـ فشل المحاصيل النباتيه ٠
ج ـ الاسر التى تعول اكثر من طفلين دون سن الخامسه ٠

د ـ علامات واعراض الغشاوه

١ـ بقع بيوتن وهى شبيه بالفوه او الجبنه البيضاء وتظهر فى بياض العين ٠
٢ـ جفاف الملتحمه وهى المنطقه التى تحد بجفن العين ٠
٣ـ جفاف وتقرح سواد العين ٠
٤ـ الغشاوه وبداية ذوبان سواد العين ٠
٥ـ تخديش القرنيه ظهور خدوش بيضاء فى سواد العين ٠

هـ الجرعات

هناك طريقتان لتناول الفيتامين أ ـ جرعه وقائيه وجرعه علاجيه

الجرعه العلاجيه ـ للاطفال الذين تظهر عليهم اعراض نقص فيتامين أ والحصبه

تعطى للطفل مئتان الف وحده دوليه (٢٠٠ر٠٠٠) من الفيتامين أ فى شكل كبسوله او دواء سائل على النحو التالى
أ ـ فى اليوم الاول ٢٠٠ر٠٠٠ الف وحده عالميه كبسوله او سائل ٠
ب ـ فى اليوم الثانى نفس المقدار من الدواء ٠
ج ـ ثم بعد اسبوع يكرر نفس المقدار ٠

* لاتوجد اى خطوره من الفيتامين أ اذا استعمل حسب الارشادات ٠

الجرعه الوقائيه ٠ـ

اعطى كبسوله او سائل من ذات الجرعه العالميه ٢٠٠ر٠٠٠ وحده لكل الاطفال دون سن الخامسة عشر مره كل ثلاثه أشهر ٠

منظمة اليونسيف ـ السودان ـ مايو ١٩٨٥ ٠
هيلن كيلر العالميه ٠

APPENDIX IV

VISIT TO OMDURMAN, NEAR KHARTOUM

Omdurman Camp, Kordofan Province, Sudan - May 15th and 16th, 1985.

Children up to age 15 years - Victoria M. Sheffield, COMT.
All children with signs of xerophthalmia were between ages 3-12 years.

Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar
124	15 (12.1%)	4 (3.2%)	0	0

Omdurman, the suburban area around the ancient capital of Omdurman, is about 20 minutes from Khartoum center. The population of the growing displaced persons' camp is approximately 53,000 Sudanese nationals coming from all parts of Kordofan Province in search of food. At present, the camp is in control of the military authorities in Khartoum Province. However, as yet, there are no formal health services, water facilities, or registration and supervision procedures. The people arrive and pitch a shelter of sticks, cloth and mats on the arid desert sand and wait. The daily temperatures range from 105° to 115° Farenheit and the only water supplies come directly from the Nile River in oil drums pulled on donkey carts. The expansive desert area is littered with camel, cattle and goat carcasses. At present, there is no food aid reaching these people.

During the visit made by myself and Mr. Egil Hagen, head of UNICEF's Emergency Department, we met a Sudanese physician, Dr. Hashim Mustafa Giddo who was running a small tented clinic sponsored by the International Relief Friendship Foundation which is supported by the Japanese government. Medicines had been bought and supplied by anonymous individuals belonging to a large, wealthy Sudanese organization known as Ansara Suna. Also, we met with two French doctors running a tented center sponsored by Medicines Sans Frontieres. The Islamic and African Relief Agency, CONCERN (Irish), Sudan Aid (Christian and Sudanese), Oxfam, and local Catholic Churches were planning to provide nutrition aid, medical care and water once they received the authority to do so.

The Khartoum authorities had tried to evict the people because of the legitimate concern that disease would break out and severe public health problems would threaten the city of Khartoum. Approximately two weeks after my visit to Omdurman, Mr. Hagen informed me that, during a meeting with the military authorities and various relief agencies, the authorities will now allow agencies to establish health facilities, dig wells, and start feeding programs. He said that one of the convincing arguments was the concern expressed by HKI about the risk of blindness among children due to vitamin A deficiency. I assume that private voluntary agencies will move in and the camp will be run in much the same way as other displaced persons' camps around the country with feeding centers and clinics in operation.

APPENDIX V

REPORTS FROM ASSESSMENT OF VITAMIN A DEFICIENCY IN RED SEA PROVINCE

Prevalence Survey of Blinding Diseases - Gebeit Elma'adin
Red Sea Province, Sudan - May 20th, 1985.

Children up to age 15 years - Dr. H.S. Chana & Victoria M. Sheffield, COMT.

Number Examined	Conjunctival Xerosis	Bitot's Spots	Conreal Xerosis, Ulceration/Keratomalacia	Corneal Scar	Trachoma
64	3 (4.7%)	0	0	0	0

The town of Gebeit Elma'adin, approximately three hours due west of Muhammad Qol which is approximately six hours north of Port Sudan, surrounds a gold mine which is a joint venture of the Sudanese Government and a British mining company. It is an ancient Egyptian gold mine which was active until 1947 and run in the 1920's by the Irish. The population of Gebeit Elma'adin is approximately 600 and they have been sedentary for two to three generations now. They are Bejas of the Atman and Kelab sub-tribes. Approximately 60 Sudanese men work at the mine and their families live in the village. Because the village is supported by the mine, the Sudanese there have a higher standard of living than other Sudanese in the hills of Red Sea Province. Each family has camels, goats and can even afford to buy tinned beans and other foods from Egypt. Granted, where each family used to have 30 to 100 goats and some sheep, they now have only one to five because of the drought. There are no fruits or vegetables, but they have milk and cheese along with their bread and dura (grain) daily. There are traditional wells dotted throughout the village and the water table is high (approximately one meter down). There has been rain in Gebeit, up to four inches in one hour the week of our visit. We were told by the village elder that each man has only one wife and there are no more than eight children per family although the average in our investigation seemed to be four. Fewer babies have been born because of the drought.

Dr. Chana and I examined all of the children present in the four-room school (44). We were told that there are 70 children in the school, but many were absent because of Ramadan. We then went house to house in the entire village and examined another 20 children making a total of 64. Some children were away from the village.

The children attend school six days a week and receive milk in school three times per week. The teachers told us that milk is short outside however. They also told us that they know of no blind children in Gebeit.

I believe that the relatively high standard of living accounts for the extremely low prevalence of xerophthalmia. Also, I believe that the availability of water from protected wells along with the Muslim custom of washing three times daily accounts for the zero rate of trachoma found among the children examined.

The health assistant in the village clinic, Mr. Ali Mohamed Sayed, asked us to read and translate the instructions on his UNICEF medicines. He is enthusiastic and interested in his work, however, he cannot read English and the instructions require the use of measuring tools that he does not have. The British miners say that he often comes to the mine to ask them to read labels for him. I mentioned this to Fida Hussain

of the JNSP in Port Sudan and suggested that a consultant be hired to rewrite the labels in appropriate terms and then translate them into the local language or Arabic for Sudanese Health Workers. Mr. Ali Mohamed also had a bottle of vitamin A, 50,000 IU capsules manufactured by Intradal, Nederland/Amsterdam. He said that he gives them out to patients with anemia and to older people who complained of night blindness at a rate of two a day for three days.

Any contact to send training materials or vitamin A can be made to Mr. Ali Mohamed Sayad through:

Mr. Martyn Malkin
Mine Superintendent
Gebeit Mine
P.O. Box 573
Port Sudan

Prevalence Survey of Blinding Diseases - Muhammad Qol
Red Sea Province, Sudan - May 20th, 1985.

Children up to age 15 years - Dr. H.S. Chana & Victoria M. Sheffield, COMT.

Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar	Trachoma
67	7 (10.4%)	2 (3.0%)	0	1 (1.5%)	3 (4.5%)

One child with right exotropia and horizontal nystagmus.
One child with iris coloboma with cataract, left eye.

The people of Muhammad Qol, approximately six hours north of Port Sudan, are Muslims of the Korbab sub-tribe. They all speak Beja and some speak Arabic. The people's diet consists of beans, peas, rice, fish, goats' milk (very limited), tea and sugar. Water comes from Shanab in the north by tanker and there is never an adequate supply. Powdered milk is provided by the Saudi Arabian Relief, but it is not fortified with vitamin A.

Because of time constraints, we went to the boarding school where we met the principal, Mr. Fathara A. Rahman Abdulla. He allowed us to examine the children in the school. There are 78 children registered at the school with 36 boarding and 42 who live outside in Muhammad Qol town. Mr. Assafi Al Hasan, the health assistant in town assisted us. Mr. Fathara Rahman told us that there was only one child with serious eye problems. The child saw poorly in the daytime and was virtually blind at night. When this child was presented, he was found to have an exotropia and nystagmus indicating a nurological visual deficit. This child had no visible signs of xerophthalmia. The principal also told us that the school children receive milk with tea each morning, milk each day and fish each day.

Many children in Muhammad Qol work at sea as fishermen and are not home during the day. These children do not go to school and would be difficult to find for examination.

Children with signs of xerophthalmia were given vitamin A immediately. A small supply was left with Mr. Assafi Al Hasan along with training materials. Mr. Assafi Ali would like to get a larger supply of vitamin A either from UNICEF or from HKI in the future.

Prevalence Survey of Blinding Diseases - Sinkat West
Red Sea Province, Sudan - May 21st, 1985.

Children up to age 15 years - Dr. H.S. Chana & Victoria M. Sheffield, COMT.

Number Examined	Conjunctival Xerosis	Bitot's Spots	Corneal Xerosis, Ulceration/Keratomalacia	Corneal Scar	Trachoma
100	12 (12.0%)	8 (8.0%)	0	0	3 (3.0%)

Sinkat town is approximately two hours south of Port Sudan on the Kassala road which is tarmac all the way. The population of Sinkat town is approximately 7,000 and the entire area including Gebeit (20 miles away) and Arkobit is approximately 16,000. They are mostly Nomadic of the Hadandawa tribe. Medical Volunteers International (MVI), Save the Children/UK (SCF/UK), and the League of Red Cross Societies (LRCS) run feeding centers. Oxfam/UK, the UN World Food Programme(WFP), USAID, the Red Cross and Red Crescent, and Saudi Arabian Relief provide food to these agencies. These foods include dura, sugar, oil, and powdered milk (non-EEC and Saudi Arabian stocks are unfortified). The people do not eat fish. Water comes from general supplies. UNICEF has recently dug more hand-pump wells.

Sinkat people buy dura flour and goats' milk, their staples. However, they used to buy goats' milk from the rural areas and this is now impossible. When available, some people buy molokhia (green leafy vegetable), gir gir (like asparagus) and dates. The dates come from Saudi Arabia or Egypt and are mixed with milk or meat. There is much coffee and tea in the suk (market) and people sell their blankets and other goods to obtain coffee and tea.

According to Dr. Abdalrahman Osman Abdalsamad of the Sinkat Hospital, most people presenting at the hospital in December 1984 complained of night blindness. Many had Bitot's spots and corneal ulcers. Dr. DeNoso of the WHO and a representative from Roche Pharmaceuticals which manufactures vitamin A reported high rates of vitamin A deficiency at that time. Dr. DeNoso advised Dr. Abdlerahman to break open the 300,000 IU oil-miscible injectible vitamin A and give it by mouth for effective results. Also in December 1984, there was a severe outbreak of measles, the highest prevalence of tuberculosis anywhere in Sudan, and much gastroenteritis and dysentery. A U.S. Navy study at the Port Sudan Hospital Lab said that the diarrheas were responsive to ampicillin and most probably were caused by shigella and not amoebas. Child mortality in the Red Sea Province is said to be 40%.

In January 1985, the government implemented a measles vaccination program which was financed by the UNSP. In March 1985, Oxfam distributed UNICEF 200,000 IU vitamin A capsules to MVI, SCF/UK, and LRCS for distribution (Appendix III). Since the influx of food aid and the measles vaccination program, the health and nutrition status of the people has improved greatly. This is the impression of health workers in all agencies working in the Sinkat area.

Meeting with Louise Hamberg and Milja Heinonen, two nurses with the LRCS, we learned that the LRCS is doing mobile work in the hills to try to reach people before they become displaced. They see "a lot of vitamin A deficiency" including keratomalacia even now among children

living in the hill areas.

There are no village groups in the Red Sea Hills. Most people are dispersed living in tents in family groups. District Councils call these family groups population centers and lists 110 of these centers in the Sinkat/Gebeit area. The people have a few camels and goats, and no sheep or cattle where they used to have hundreds. Families used to have 30-100 goats and sheep and now have only one to five. The people at Haiya have a few cows left, however, it is not common to have cows at all among the general population. The people buy unfortified dried skim milk which can be found in the market. There is no whole milk available. The rural people used to sell goats' milk to the people of Sinkat and Gebeit, but now do not have enough for themselves much less any left to sell.

The LRCS operates 19 "feeding spots" which include a primary health care center. There are eight other feeding centers at Tahamiyan (4), Sinkat (2), Amarand (1), and Sangalin (1). The two at Sinkat are called Sinkat East and Sinkat West. Some of the displaced people in these camps also come from Sinkat town. We performed our survey on 100 children in Sinkat West.

The health professionals in these camps are experienced with vitamin A deficiency and are treating patients as they find them as well as organizing mass dosing campaigns.

Mass Campain to Dose Vitamin A in Areas South of Port Sudan - March 1985.

UNICEF's Joint Nutrition Support Project (JNSP) gave Oxfam/UK vitamin A which was then distributed to various health agencies for distribution to the Sudanese children.

Vitamin A, 200,000 IU capsules, were distributed as follows:*

SINKAT - 7,500 capsules for clinics and health posts via Ibrahim Issa, Health Inspector - League of Red Cross Societies (LRCS) responsible for distribution in Sinkat camps.

TEHAMIYAN - 3,500 capsules for clinics and health posts via Ali Aberamad, Medical Assistant. Camps in this area will be covered by the LRCS using LRCS/World Food Programme(WFP) transport.

HAIYA - 3,000 capsules for clinics and health posts via Tahir Omur, Health Inspector - Save the Children(SCF/UK).

DERUDEB - 3,500 capsules supplied via Hashim Ali Issa for camps, clinics and health posts.

PORT SUDAN - at the time of the Oxfam report, distribution was yet to be arranged through an appropriate health inspector in Port Sudan.

NORTH TOKAR - 1,150 capsules to be distributed by the staff of Medical Volunteers International (MVI).

* taken from an Oxfam/Port Sudan distribution plan, March 1985.

APPENDIX VI

HEALTH CARE INFRASTRUCTURE

Health Care Infrastructure

Sudan

I. Ministry of Health - Khartoum: Minister of Health and department heads.

II. Regions: Minister of Services which includes health, education, youth and sports, and social welfare.

A. Director General of Health under each Minister of Services.

1. Regional Director of Health - curative.
2. Regional Director of Health - preventive.

B. Director General of Education and Social Welfare also under the Minister of Services.

III. Provinces: Assistant Director of Health (M.D.).

IV. Districts (Areas): Senior Medical Inspector (medical officer) located in the district hospitals.

V. Communities: primary health care complex which consists of one dispensary and five primary health care units.

According to the 1983 Regional Government Act, then President Nimeiry decentralized the government in order to strengthen and maintain district governments. Local governments now had the authority to levy taxes and had limited administrative, executive, and legal powers. People of the Beja tribes in the east as well as Christians in the south were pleased by this action. Since the military coup d'etat which deposed President Nimeiry on April 6th, 1985, all regions and provinces are run by the military chief commander. There are no longer any ministers. District councilors remain the same.

According to the WHO's "Health for All by the Year 2000", there will be one Primary Health Care Complex per 7000 people in the Sudan:

One dispensary per 2000 people and
One primary health care unit per 1000 people =
One Primary Health Care Complex per 7000 people

At present, there are over 4000 community health workers (CHW) and over 4000 trained midwives. A Primary Health Care Complex is run by a medical assistant with 5 CHW's and 5 midwives per complex. The present population in the Sudan is 21 million with 80% in the rural areas. With 7000 people being covered by one Primary Health Care Complex, there is a need for 3000 Primary Health Care Complexes which would require 15,000 CHW's and 15,000 trained midwives. With only 4000 of each at present, the system has only 27% coverage.

Training of CHW's and midwives with integration into the primary health care delivery system is new for the Sudan. Training activities must be a major focus of the MOH in order to achieve their goal by the year 2000.

There is a network of public health workers who travel to rural areas. The structure is as follows:

- Provincial Level - Senior Public Health Officer who reports to the Assistant Director of Health (M.D.)

- District Level - one Public Health Officer reports to the Senior Public Health Officer at the provincial level.

Each public health officer supervises the following groups of public health workers:

- sanitary overseers
- assistant sanitary overseers
- health educators
- vaccinators
- health visitors from village midwife schools at the district level (all female)

Public health officers have vehicles and travel with vaccinators to do immunization programs. This network of public health workers would be the best group to implement a vitamin A prophylaxis program among Sudanese nationals.