WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
Ministry of Health
231, de Saram Place, Colombo 01000, Sri Lanka
Tele: + 94 11 2695112, Fax: +94 11 2696583, E mail: epidunit@sltnet.lk
Epidemiologist: +94 11 2681548, E mail: chepid@sltnet.lk
Web: http://www.epid.gov.lk

Vol. 38 No.44 **29th October – 04th November 2011**

WER SRI LANKA - 2011

Coliform outbreak-Kurunegala

Background

Nine (9) neonatal deaths have occurred from 18th of August to 5th of September 2011 in the PBU I of Teaching Hospital, Kurunegala. Number of deaths which occurred during the month of August far exceed the expected numbers. Some of the neonates which died had Coliform positive blood cultures. Therefore the presence of a Coliform outbreak was evident.

Description of the outbreak

- Three (3) of the neonates who died were born on or after 34 weeks of POA (33.3%)
- Three (3) of them had birth weights more than 1.8 kg
- Only one neonate had a birth weight of more than 1.8 kg while having a POA of more than 34 weeks.

The presence of Coliforms in the blood culture of six neonates out of the nine dead implicated Coliforms as the main group of organisms responsible. The presence of Coliforms in the wound (proven by the swab culture) of the only surviving neonate also implicates Coliforms as the main group of organisms responsible for the outbreak. *Staph. aureus* was also present in the blood culture of a neonate who died due to septicaemia.

Delivery types and antibiotic sensitivity patterns of the dead babies

Types of delivery are approximately equally distributed among the dead babies [vaginal deliveries including vacuum deliveries 4 (44.4%), LSCS 5 (55.6%)]. Out of the babies who were positive (Blood) for Coliforms, three (3) were LSCSs (50%) and three (3) were vaginal deliveries (50%). Therefore, neither the labour room nor the operation theatre seems to be implicated. There were no reports of ill babies from the wards.

The infection appears be occurring in the PBU. As all of the babies were treated in PBU I, this is the most logical place for the occurrence of infection.

The baby who died first (18th August) shows a different (baby 1) antibiotic sensitivity from the rest (Please see figure I). Baby 2, 3 and 4 show similar antibiotic sensitivity patterns. Baby 5 and 7 are also show similar antibiotic sensitivity patterns. Baby 6 also appears broadly similar to baby2, 3 and 4.

Antibiotic Sensitivity Patterns of Coliforms

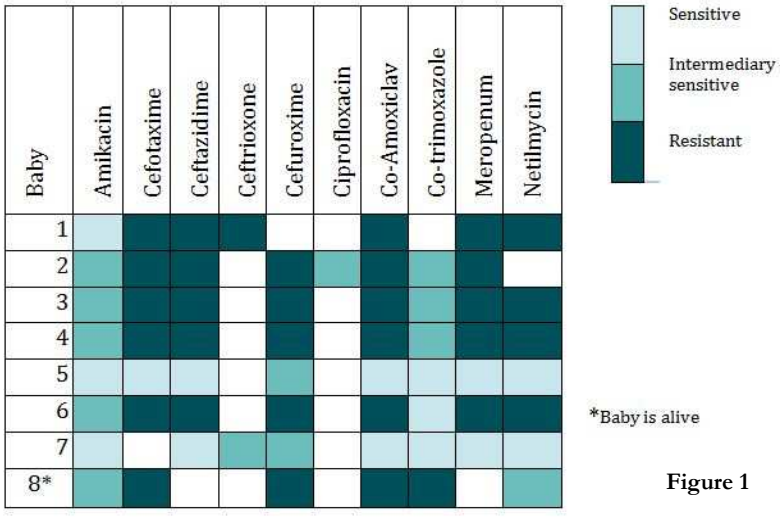

Figure 1

Therefore it is apparent that there were at least 3 separate Coliform infections/strains in the neonates who died. The neonate who is still alive seems to harbour a different organism/strain from the rest. Therefore, it is safe to assume the continuous introduction of infections to the neonates.

Three neonates with similar antibiotic patterns have stayed in the PBU during the same period of time. The neonate showing broadly similar antibiotic sensitivity pattern to the other three has also stayed in the PBU during the same period. Therefore, cross infection/ infection from a common source is most likely.

Contents	*Page*

Typing was done on five of the samples that were positive for coliform and all five were identified as *Klebsiella pneumoniae*.

Observations

- PBU I- Aseptic techniques were being observed by the staff (e.g. face masks, sterile gowns and separate shoes for the PBU).
- Facilities were provided for hand washing, including soap.
- Constructions were carried out in the A side of the PBU during this period and neonates were transferred to B side of PBU during that time.
- Construction might have given rise to excessive amount of dust in the environment, and it might have introduced some dust into the PBU in spite of air-conditioning. This dust might have introduced infections. Even though there is no direct evidence, the presence of a constant source of infections is evident by the presence of differing antibiotic sensitivity patterns.
- Overcrowding of babies when they were in the B side might have facilitated the cross infections.
- PBU II seems to function like a SCBU (Special Care Baby Unit) without facilities for ventilation.
- Labour rooms and operation theatre maintained adequate levels of aseptic conditions.

Discussion

Differing antibiotic sensitivity patterns indicate the presence of three separate strains of *Klebsiella*/ three different organisms of the Coliform group or a mixture of both. This indicates the continous introduction of infections to the PBU, as opposed to all of them originating from the same source.

Coliforms consist of different types of bacteriae consisting of *Escherichia, Enterobacter, Klebsiella, Serratia, Citrobacter and Proteus*. Collectively, these are Gram-negative bacilli (except *Proteus*). Most of these organisms are members of the normal flora of humans and/or animals and are considered opportunistic pathogens.

Diseases produced by the Coliforms can be grouped into three general categories:

- Nosocomial or hospital-acquired infections
- Infections in compromised patients
- Community acquired infections

Neonates in the PBU are either premature or sick or both. It makes them highly susceptible to these infections.

Multiple reservoirs and modes of transmission exist for these organisms. They may be found in water (tap or distilled), soil, food and the intestinal tract as well as contaminated hospital food or containers, respiratory equipment, haemodialysis units, intravenous (IV) fluids or caps of staff members. Thus, there are both exogenous and endogenous sources for contamination by these organisms.

Coliforms can spread due to faecal contamination of water source by mammals and birds. *Klebsiella pneumoniae* exist in the soil and in water as a free-living microorganism. Many outbreaks of *Klebsiella pneumoniae* infections in the NICUs have frequently been shown to have an environmental reservoir. Irrespective of the primary source, the lower digestive tract of the colonized neonates is the main reservoir of these micro-organisms, and cross contamination is presumably hand carried by the attending staff.

Therefore, the presence of an environmental reservoir and continuous introduction of infections to the PBU from outside cannot be ruled out.

Suggestions and Recommendations

- Further studies (typing) to ascertain the existence of different organisms/strains of bacteriae (even though it is evident from the antibiotic sensitivity patterns).
- Exploration of means of introduction of infections continuously – environment reservoirs cannot be ruled out. Therefore, Intermittent water samples (contamination of water supply from leaking sewage pipes is known to occur) should be checked for the presence of bacteria in water.
- Surface swabs (swabs from walls, door handles, stethoscopes, incubators or any other surface that can harbour and transmit the infection to the neonates) should be taken to detect the presence of environmental reservoirs regularly.
- Reduction of dust in the environment should be done to prevent introduction of dust and environmental organisms into the PBU. Speedy completion of construction projects will be helpful in attaining this end.
- Regular cleaning with an appropriate antiseptic and steps to minimize the spread of infection from one baby to another should be carried out.

Practices such as-

- Minimal handling of babies
- Frequent hand washing (use of soap dispensers would help improve this practice due to the ease of use)
- Use of alcohol gel for more frequent hand cleaning
- Using new gloves when handling babies (especially very low weight , very premature and sick)
- Wearing of sterilized face masks and gowns in the PBU
- Keeping separate items for each baby (e.g. Separate stethoscope for each baby etc)
- Proper cleaning of items used for the management of babies, including ventilators, suckers etc (including filters)
- Supervision of sterilizing and cleaning procedures by the infection control team should be emphasized and continued. Chapter on Infection Control (chapter 18) of the Manual on management of Teaching, Provincial, Base and Special hospitals (Ministry of Health, 1995) would be helpful in this regard.
- Babies suspected of harbouring infections should be segregated (as already being done). Facilities should be provided for the ventilation of these babies at the same place.
- Any new infections in the PBU should be informed to the consultant microbiologist for appropriate action.

Acknowledgements

I would like to thank Director of the Teaching hospital Kurunegala, Dr. M.D.S. Rajamanthrei (MD), Consultant Microbiologist Dr. Samanmalie Gunasekera (MD) and Infection Control Nursing officers for their kind support. I greatly appreciate the guidance provided by Dr. Ananda Amarasinghe (Assistant Epidemiologist) in preparation of this article.

Sources

Colifoms.- Southern Illinois university, 2011, available from http://www.cehs.siu.edu/fix/medmicro/colif.htm

Extended Spectrum b Lactamase Producing Klebsiellapneumoniae in Neonatal Intensive Care Unit- Krishna BVS, Patil1 AB, and Chandrasekhar MR, 2007, available from http://medind.nic.in/icb/t07/i7/icbt07i7p627.pdf

Compiled by Dr. Madhava Gunasekera of the Epidemiology Unit

Table 1: Vaccine-preventable Diseases & AFP

22nd – 28thOctober 2011 (43rd Week)

Disease	No. of Cases by Province									Number of cases during current week in 2011	Number of cases during same week in 2010	Total number of cases to date in 2011	Total number of cases to date in 2010	Difference between the number of cases to date in 2011 & 2010
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	00	04	75	72	+ 04.2 %
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Measles	00	00	01	00	00	00	00	00	00	01	00	114	86	+ 32.5 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	24	20	+ 20.0 %
Whooping Cough	01	00	00	00	00	00	01	00	00	02	01	48	29	+ 65.5 %
Tuberculosis	126	12	00	01	25	23	71	01	09	268	335	7795	8467	- 07.4 %

Table 2: Newly Introduced Notifiable Disease

22nd – 28thOctober 2011 (43rd Week)

Disease	No. of Cases by Province									Number of cases during current week in 2011	Number of cases during same week in 2010	Total number of cases to date in 2011	Total number of cases to date in 2010	Difference between the number of cases to date in 2011 & 2010
	W	C	S	N	E	NW	NC	U	Sab					
Chickenpox	12	03	12	01	09	06	06	19	07	75	25	3628	2853	+ 26.7 %
Meningitis	02 GM=1 CB=1	00	00	00	00	00	02 AP=2	04 BD=2 MO=2	00	08	16	734	1168	- 27.2 %
Mumps	07	06	12	01	17	01	05	07	20	76	17	2719	995	+ 173.3 %
Leishmaniasis	00	00	01 HB=1	00	01 TR=1	00	11 AP=2 PO=9	00	00	14	06	689	325	+112.0 %

Key to Table 1 & 2

Provinces: **W**: Western, **C**: Central, **S**: Southern, **N**: North, **E**: East, **NC**: North Central, **NW**: North Western, **U**: Uva, **Sab**: Sabaragamuwa.

DPDHS Divisions: **CB**: Colombo, **GM**: Gampaha, **KL**: Kalutara, **KD**: Kandy, **ML**: Matale, **NE**: Nuwara Eliya, **GL**: Galle, **HB**: Hambantota, **MT**: Matara, **JF**: Jaffna, **KN**: Killinochchi, **MN**: Mannar, **VA**: Vavuniya, **MU**: Mullaitivu, **BT**: Batticaloa, **AM**: Ampara, **TR**: Trincomalee, **KM**: Kalmunai, **KR**: Kurunegala, **PU**: Puttalam, **AP**: Anuradhapura, **PO**: Polonnaruwa, **BD**: Badulla, **MO**: Moneragala, **RP**: Ratnapura, **KG**: Kegalle.

Data Sources:

Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps.

Special Surveillance: Acute Flaccid Paralysis.

Leishmaniasis is notifiable only after the General Circular No: 02/102/2008 issued on 23 September 2008. .

Dengue Prevention and Control Health Messages

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them free of water collection.

Table 4: Selected notifiable diseases reported by Medical Officers of Health

22nd – 28thOctober 2011 (43rd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Returns Received
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	128	8098	2	169	0	6	19	267	1	59	23	409	0	8	3	63	0	2	**85**
Gampaha	94	3321	1	118	1	17	5	86	0	81	6	461	0	24	17	318	0	6	**80**
Kalutara	23	1108	2	146	0	9	2	74	0	26	9	340	0	3	0	11	0	1	**92**
Kandy	63	1103	2	349	0	7	1	37	0	40	2	158	1	99	2	51	0	0	**87**
Matale	5	288	15	176	0	4	1	34	0	23	0	154	0	14	1	12	0	0	**83**
Nuwara	20	210	2	314	0	4	1	56	21	110	0	50	0	63	1	31	0	1	**69**
Galle	14	732	1	99	0	6	3	29	0	8	1	200	1	40	0	10	0	5	**58**
Hambantota	2	357	3	61	0	4	1	5	0	29	0	482	3	61	0	15	0	1	**100**
Matara	22	475	2	82	0	3	0	16	1	32	3	332	1	75	1	22	0	1	**94**
Jaffna	4	295	12	309	0	3	11	255	3	91	0	2	2	197	1	30	0	1	**100**
Kilinochchi	1	55	2	35	0	3	1	11	0	13	0	2	0	11	0	3	0	0	**0**
Mannar	8	43	0	23	0	1	0	31	0	83	0	13	0	33	0	2	0	0	**60**
Vavuniya	0	70	0	33	0	12	0	10	0	56	0	45	0	2	1	2	0	0	**100**
Mullaitivu	0	16	1	61	0	1	2	7	0	9	0	5	0	1	0	2	0	0	**75**
Batticaloa	58	846	3	558	0	5	0	7	0	27	0	27	0	3	0	2	0	6	**86**
Ampara	2	146	8	200	0	1	0	11	0	47	0	57	0	1	1	9	0	0	**86**
Trincomalee	0	145	7	628	0	2	0	10	0	12	1	92	0	7	0	7	0	1	**100**
Kurunegala	18	822	7	321	0	12	2	95	0	85	5	1501	3	76	8	58	0	4	**87**
Puttalam	7	427	2	173	0	1	0	31	16	25	1	118	0	18	0	7	0	2	**67**
Anuradhapu	11	253	3	125	0	2	0	5	0	34	0	239	1	17	3	24	0	1	**74**
Polonnaruw	4	266	2	116	0	1	0	14	0	22	0	82	0	1	0	16	0	0	**86**
Badulla	10	530	9	335	0	6	2	54	0	24	0	75	0	82	2	60	0	0	**76**
Monaragala	5	236	4	125	0	4	0	35	0	13	0	179	2	73	7	85	0	0	**100**
Ratnapura	16	882	1	458	0	7	0	51	0	26	10	533	0	28	6	56	0	2	**78**
Kegalle	32	837	1	106	0	12	0	73	0	24	9	322	0	33	7	232	0	0	**100**
Kalmune	0	34	4	545	0	0	1	2	13	85	0	6	0	2	0	3	0	1	**77**
SRI LANKA	**547**	**21595**	**95**	**5665**	**01**	**133**	**52**	**1306**	**55**	**1084**	**70**	**5884**	**14**	**972**	**61**	**1131**	**00**	**35**	**82**

Source: Weekly Returns of Communicable Diseases WRCD).
***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever.
****Timely** refers to returns received on or before 28th October , 2011 Total number of reporting units =329. Number of reporting units data provided for the current week: 270
A = Cases reported during the current week. **B** = Cumulative cases for the year.

PRINTING OF THIS PUBLICATION IS FUNDED BY THE WORLD HEALTH ORGANIZATION (WHO).

Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail to **chepid@sltnet.lk.**

ON STATE SERVICE

Dr. P. PALIHAWADANA
CHIEF EPIDEMIOLOGIST
EPIDEMIOLOGY UNIT
231, DE SARAM PLACE
COLOMBO 10