WEEKLY EPIDEMIOLOGICAL REPORT

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Ministry of Health, Nutrition & Indigenous Medicine

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

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Microcephaly

What is microcephaly

Microcephaly is a condition where a neonate's head size is smaller than expected for the age and sex. This can be detected by measuring the Occipito- Frontal Circumference (OFC) of the baby. In microcephaly, the OFC is more than three standard deviations below the normal level. Microcephaly can range from mild to severe.

Scope of the problem

Microcephaly is not a very common occurrence. However, it is estimated that, incidence of microcephaly ranges from 2 per 10 000 live births to 12 per 10 000 live births in the United States. Besides, there can be variations in incidence reports due to differences in definition of microcephaly.

Causes and risk factors

Aetiology of microcephaly can be broadly divided into two categories– genetic or primary causes and non genetic or secondary causes.

Primary microcephaly includes a group of conditions where there are no other associated malformations. Primary microcephaly either occurs according to a mendelian pattern of inheritance or associated with a specific genetic syndrome. Microcephaly is sometimes autosomal recessively inherited. Incidence of autosomal recessive microcephaly is 1 in 40 000 live births and it is associated with severe mental retardation and prominent seizures. Microcephaly can be inherited in an autosomal dominant pattern also. It may or may not be associated with mental retardation and when mental retardation is present it is usually mild or border line. Down's syndrome (trisomy 21), Edward syndrome (trisomy 18), Cri – Du– Chat (chromosome 5p deletion), Cornelia de Lange syndrome, Smith Lemli Optiz syndrome are some of the genetic syndromes which are associated with microcephaly.

Secondary microcephaly occurs due to a noxious event which affects the foetus in utero or the infant particularly in the first two years of life where rapid brain growth occurs. Congenital infections which occur due to maternal primary infection during pregnancy is one such event. Rubella, Cytomegalovirus, Toxoplasmosis gondii, Parvo virus, Varicella zoster, Syphilis are some of the congenital infections which can cause microcephaly in the newborn. Usually the affected neonates have other associated malformations as well. Apart from that, maternal exposure to certain drugs, alcohol, radiation, heavy metals like Arsenic and Mercury and smoking can affect the foetus and cause microcephaly in the neonate. Hypoxic– ischemic damage to the developing brain initially causes diffuse cerebral oedema. However, affected children develop cerebral atrophy in later stage.

Other associated problems

On some occasions, there are other clinical manifestations in children with microcephaly. They include developmental delay, intellectual impairment, problems with movement and balance, hearing loss, visual impairment and sei-

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zures. Occurrence and severity of these manifestations can vary with the severity of microcephaly. On the other hand, some children with microcephaly can be otherwise healthy.

However, it is difficult to predict at birth the problems that the child can develop in later life. Therefore, frequent follow up of the child with microcephaly is essential to identify these problems early and start treatment appropriately.

Diagnosis

Diagnosis of microcephaly is often made at birth by measuring the OFC and plotting it in standard growth charts. Measurement is interpreted in relation to the gestational age, weight and height of the baby to come to the diagnosis.

Best time to measure the OFC is at least 24 hours after birth. This allows for the compression of the head which occurs during the passage through the birth canal to resolve. Serial measurement of the head circumference is beneficial specially in milder forms of microcephaly.

Microcephaly can be diagnosed even before the birth by ultrasonograghy. Ultrasound scan done in the late second trimester or early third trimester helps in diagnosis of microcephaly.

Further investigations to identify the aetiology of microcephaly should be guided by thorough history and physical examination. The baby can have other clinical features associated with genetic disorders, congenital infections or syndromes which will help in diagnosis.

CT scan and MRI scan of the brain can identify structural abnormalities of the brain like microgyria and cerebral calcifications. Cerebral calcifications are associated with congenital infections. Further investigations like detection of maternal seroconversion of antibodies, IgM antibody detection in the baby, virus detection in urine of the baby can be done to identify congenital infections. Apart from that, if the features are suggestive of a genetic syndrome, karyotyping can be done for definitive identification.

Management

Although there is no definitive treatment for microcephaly, a multi disciplinary approach can improve the child's condition. The management plan includes frequent follow up of the child to detect other associated problems like seizures, visual and hearing impairment etc. and management of those associated problems with medication and other specific therapies like speech therapy. As these children are usually developmentally delayed, it is important to give continuous stimulation to achieve developmental milestones. Family counselling regarding the prognosis, importance of the management, possibility of other children in the family being affected is an integral part of the management plan. Parents should also be given information regarding the services and facilities available for these children.

Association of microcephaly with Zika disease

About Zika disease

Zika virus is a mosquito borne Flavivirus. Zika virus was first identified in Rhesus monkeys in Uganda in 1947. The first human cases of Zika infection were detected again in Uganda and Tanzania in 1952. Infection with Zika virus usually causes mild illness consisting of mild fever, skin rash, conjunctivitis, muscle and joint pain that usually lasts for 2- 7 days.

Incubation period for Zika infection is likely to be few days. Zika virus is primarily transmitted by infected mosquitoes of genus *Aedes*, mainly *Aedes aegypti* which is the same mosquito that transmits Dengue, Chickungunya and Yellow fever. Sexual transmission of Zika virus is also possible.

Recent Zika disease outbreak

The most recent outbreak of Zika disease has started in 2015. Upto 22nd September 2016, 73 countries have reported Zika cases.

Possible link

Along with the Zika outbreak in Brazil, an unusual increase in microcephaly among newborns was reported. Up to now 21 countries have reported microcephaly and other neurological malformations. Four of these 21 countries have not reported endemic Zika virus transmission. However, mothers of the affected babies in these 4 countries have travelled to countries with endemic Zika virus transmission.

This has triggered the scientists to look for a possible link between Zika infection and microcephaly. Based on prilimionary research findings, Now there is scientific consensus that zika virus is a cause of microcephaly.

Sources

World Health Organization official website

Center for Disease control and prevention official website

Compiled by Dr. S.A.I.K. Sudasinghe of the Epidemiology Unit

Table 1: Selected notifiable diseases reported by Medical Officers of Health 17th – 23rd Sep 2016 (39th Week)

RDHS Division	Dengue Fever		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Typhus Fever		Viral Hepatitis		Human Rabies		Chickenpox		Meningitis		Leishmaniasis		WRCD	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	T*	C**
Colombo	142	13248	0	133	0	11	2	51	1	35	5	229	0	7	1	38	0	0	5	358	3	50	0	0	94	100
Gampaha	31	5443	0	118	0	13	0	23	0	32	2	266	1	15	0	33	0	1	1	330	1	38	0	7	27	80
Kalutara	31	2815	1	84	1	9	0	29	0	29	1	357	0	7	0	24	1	1	7	228	4	74	0	0	71	86
Kandy	43	3377	3	135	0	16	0	20	0	33	4	107	2	82	1	45	0	0	0	180	1	35	0	9	78	100
Matale	12	824	0	49	0	1	1	12	0	4	4	81	0	19	0	16	0	1	0	28	0	52	0	17	62	92
NuwaraEliya	5	353	0	85	1	3	1	52	0	36	0	51	0	62	0	34	0	0	0	118	1	36	0	0	100	100
Galle	26	1789	0	117	0	8	0	7	0	8	8	222	0	97	0	9	0	0	1	242	0	33	0	3	50	85
Hambantota	15	653	2	58	0	1	0	4	1	58	0	92	1	57	9	91	0	0	2	190	0	14	9	268	83	100
Matara	29	1008	2	104	0	13	0	7	0	38	2	155	2	46	4	33	0	0	4	153	2	22	4	166	94	100
Jaffna	22	1775	15	235	0	6	0	74	0	54	0	12	3	583	0	8	0	0	1	146	2	52	0	1	100	100
Kilinochchi	0	68	1	36	0	0	0	35	0	9	0	13	0	24	0	0	0	0	0	10	0	10	0	0	50	100
Mannar	2	110	0	26	0	4	0	22	0	9	0	9	0	38	0	0	0	0	0	7	1	3	0	0	60	80
Vavuniya	1	214	0	13	0	4	1	84	0	33	0	13	0	10	0	6	0	0	0	26	0	10	0	6	75	100
Mullaitivu	0	150	0	24	0	2	0	17	0	40	0	24	0	6	0	2	0	1	0	20	0	7	0	6	60	80
Batticaloa	1	448	4	249	0	3	0	41	1	92	0	41	0	6	0	11	0	0	1	87	0	13	0	1	71	86
Ampara	0	208	0	46	0	2	0	0	0	21	0	26	0	0	0	9	0	0	0	133	0	4	0	6	14	100
Trincomalee	3	352	0	50	0	2	0	11	0	24	1	30	0	24	0	33	0	2	0	129	0	11	0	11	67	92
Kurunegala	23	2074	2	255	0	11	1	4	0	13	1	131	2	39	0	21	1	3	8	281	0	49	1	82	66	97
Puttalam	16	914	0	73	0	4	0	6	0	0	1	38	0	61	1	3	0	1	4	77	2	50	0	4	79	86
Anuradhapura	14	588	3	81	0	3	0	6	0	26	2	251	0	25	0	15	0	0	4	200	0	36	3	201	47	74
Polonnaruwa	5	384	1	33	0	4	0	12	0	13	0	85	0	2	0	3	0	0	2	109	0	16	0	105	87	86
Badulla	20	686	2	105	0	13	0	10	2	27	1	111	1	96	0	106	0	0	0	192	3	167	0	3	59	88
Monaragala	6	343	5	74	0	1	0	3	0	11	1	155	4	112	0	118	0	2	1	61	0	19	0	33	91	91
Ratnapura	30	2464	5	300	0	29	0	25	0	23	18	456	0	32	9	156	0	0	4	185	7	130	0	1	72	94
Kegalle	20	1200	1	71	0	19	0	32	0	52	2	154	1	28	0	22	0	0	2	267	0	44	0	2	82	100
Kalmune	5	435	2	84	0	3	0	5	0	43	0	18	0	0	0	3	0	4	0	77	0	21	0	0	54	100
SRILANKA	502	41923	49	2638	2	185	6	592	5	763	53	3127	17	1478	25	839	2	16	47	3834	27	996	17	932	69	92

Source: Weekly Returns of Communicable Diseases (WRCD).

*T=Timeliness refers to returns received on or before 23rd September, 2016 Total number of reporting units 339 Number of reporting units data provided for the current week: 318 C**-Completeness

A = Cases reported during the current week. B = Cumulative cases for the year.

Table 2: Vaccine-Preventable Diseases & AFP

17th – 23rd Sep 2016 (39th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2016	Number of cases during same week in 2015	Total number of cases to date in 2016	Total number of cases to date in 2015	Difference between the number of cases to date in 2016 & 2015
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	01	00	00	01	01	53	56	-5.3%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Mumps	00	00	01	00	00	01	00	00	03	05	08	301	295	+2.0%
Measles	02	00	00	00	00	00	01	00	00	03	27	329	2238	-85.2%
Rubella	00	00	00	00	00	00	00	00	00	00	00	08	08	0%
CRS**	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Tetanus	00	00	00	00	00	00	00	00	00	00	00	08	14	-43.1%
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0%
Japanese Encephalitis	00	00	00	00	00	00	00	00	00	00	00	15	07	+114.2%
Whooping Cough	00	01	00	00	00	00	00	00	01	02	05	54	76	-29.1%
Tuberculosis	47	14	12	01	00	22	00	03	08	107	78	7013	7335	-4.3%

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.

RDHS 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, Neonatal Tetanus, Whooping Cough, Chickenpox, Meningitis, Mumps., Rubella, CRS,

Special Surveillance: AFP* (Acute Flaccid Paralysis), Japanese Encephalitis

CRS** =Congenital Rubella Syndrome

AFP and all clinically confirmed Vaccine Preventable Diseases except Tuberculosis and Mumps should be investigated by the MOH

Dengue Prevention and Control Health Messages

Look for plants such as bamboo, bohemia, rampe and banana in your surroundings and maintain them

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ON STATE SERVICE

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