WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiology Unit
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WEER SRI LANKA 2023

Vol. 50 No. 17 22nd– 28th April 2023

Heat stroke

Introduction

Heatstroke is the most severe and potentially fatal form of heat-related illness, representing the extreme end of the spectrum of heat-related illnesses. Heat illness is a common problem and is responsible for tens of thousands of deaths during heatwaves, with the number of cases predicted to rise by over 2.5 times in the next three decades.

Heatstroke is a condition in which the body's natural mechanisms for regulating temperature fail to maintain normal core body temperature, resulting in a substantial increase in body temperature. This temperature rise is primarily due to exposure to high environmental temperatures and typically exceeds 40.6°C (105°F). Heatstroke can cause dysfunction in multiple organs, including coagulopathy, respiratory failure, renal and liver injury, and gastrointestinal dysfunction. Heatstroke is often accompanied by central nervous system dysfunction, metabolic derangement, and the potential for coma. If not treated promptly, heatstroke can be fatal, with mortality rates as high as 80%. Patients requiring critical care may still have a mortality rate above 60%. Effective treatment requires prompt recognition and immediate treatment by prehospital, emergency medical and critical care teams, followed by rehabilitation and sports exercise medicine input if necessary.

As an island nation located near the equator, Sri Lanka experiences high levels of humidity and temperature throughout the year. While the country does not have distinct seasons like summer, certain regions are prone to heat waves and extreme temperatures, which increase the risk of heat-related illnesses.

Causes of Heatstroke

Heatstroke occurs due to a combination of factors, including environmental heat exposure, dehydration, and impaired thermoregulation.

Heatstroke can be triggered by exposure to hot and humid environmental conditions, which causes an elevation in body temperature in the absence of strenuous physical activity. This form of heatstroke is most commonly seen in older adults and those with chronic illnesses who are exposed to prolonged periods of hot weather. Additionally, strenuous physical activity or work in hot weather can also lead to heatstroke, particularly in individuals who are not acclimatized to high temperatures. Wearing excessive clothing that hinders the evaporation of sweat and alcohol consumption can also impair the body's ability to regulate temperature, increasing the risk of heatstroke. Dehydration due to inadequate fluid intake to replace fluids lost through sweating can further exacerbate the risk of heatstroke.

Risk factors include age (infants and elderly), obesity, heart disease, diabetes, alcohol consumption, and certain medications, such as diuretics and beta-blockers.

Symptoms of Heatstroke

The symptoms of heatstroke can vary from person to person but typically include high body temperature, rapid heartbeat, rapid breathing, dizziness, headache, nausea and vomiting, confusion or disorientation, seizures, and loss of consciousness Heatstroke is a medical condition in which the body temperature rises to more than 40°C, and it can cause brain dysfunction ranging from mild confusion to coma. It usually occurs during extreme heat waves, and elderly people are particularly susceptible to it. Patients with heatstroke experience increased body temperature, altered mental

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state, tachycardia, hyperventilation, and occasionally hypotension. Any patient presenting with an altered mental state during heat waves and after exertion should be suspected to have heatstroke regardless of their core temperature. Cardiovascular symptoms may also occur, such as hypotension, tachycardia, changes in ST-T, prolonged QT interval, bundle branch blocks, and even myocardial infarction. Gastrointestinal problems are common and can include severe diarrhoea, jaundice, and liver function abnormalities. Metabolic changes may manifest as respiratory alkalosis in classical heatstroke and respiratory alkalosis with lactic acidosis in exertional heatstroke. Exertional heatstroke may also be associated with rhabdomyolysis, hyperphosphatemia, hypocalcaemia, and hyperkalaemia. Jaundice is a frequent occurrence with transaminase levels peaking around day 3 of illness. Renal involvement is seen in almost 30% of exertional heatstroke cases and is attributed to renal hypoperfusion, rhabdomyolysis, and thermal insult.

Diagnosis of Heatstroke

Diagnosis of heatstroke is typically based on a combination of symptoms and physical examination findings. Blood tests may be done to check for electrolyte imbalances, kidney function, and other factors that can be affected by heatstroke. Diagnostic imaging, such as CT scans or MRI, may be done to assess for organ damage.

First aid/ Treatment for Heatstroke

When someone is suspected to be experiencing heatstroke, it is crucial to promptly send them to the hospital. Immediate treatment of heatstroke is crucial to prevent complications such as brain damage, organ failure, and death. Delaying medical assistance can be life-threatening. In the meantime, while waiting for medical help to arrive, provide first aid.
The first step is to lower the body temperature as quickly as possible. This can be done by removing the person from the hot environment and placing them in a cool, shaded area. The person should also be given cool water or other non-alcoholic beverages to drink. Other treatments may include applying cold water or ice packs to the person's neck, armpits, and groin to lower the body temperature, using fans or air conditioning to cool the person down, giving medications to control seizures, and providing intravenous fluids to treat dehydration and electrolyte imbalances.

Prevention of Heatstroke

Preventing heatstroke involves taking steps to avoid exposure to high temperatures and humidity, staying hydrated, and avoiding strenuous physical activity during the hottest part of the day. Other preventive measures include wearing lightweight, breathable clothing, and using sunscreen and hats to protect against the sun's rays. It is also important to be aware of the early symptoms of heatstroke and to seek prompt medical attention if these symptoms develop.

Public Health Implications of Heatstroke

Heatstroke has significant public health implications, particularly in the context of climate change. As global temperatures continue to rise, heat waves are becoming more frequent and intense, increasing the risk of heatstroke for vulnerable populations, such as the elderly and those with pre-existing medical conditions. The burden of heat-related illnesses is expected to increase in the coming years, highlighting the need for public health interventions to prevent and manage heatstroke. These interventions can include heat warning systems, education campaigns, and measures to reduce greenhouse gas emissions.

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Table 1: Selected notifiable diseases reported by Medical Officers of Health 15th– 21st Apri 2023 (16th Week)

RDHS	Dengue Fever		Dysentery		Encephaliti		Enteric Fever		Food Poi-		Leptospirosis		Typhus		Viral Hep-		Human		Chickenpox		Meningitis		Leishmania-		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	297	4587	0	3	0	7	0	1	0	6	6	85	0	0	0	2	0	0	10	92	3	12	0	5	**24**	**90**
Gampaha	35	4637	0	5	0	6	0	1	0	1	8	155	0	2	0	6	0	0	0	82	1	29	0	13	**1**	**90**
Kalutara	124	1501	2	10	0	1	0	0	0	4	35	252	0	1	0	1	0	1	12	146	0	30	0	1	**3**	**99**
Kandy	101	1222	0	13	0	0	1	3	0	11	12	80	2	29	1	2	0	1	9	107	2	8	1	13	**78**	**100**
Matale	40	462	0	1	0	0	0	1	0	4	8	52	0	5	0	2	0	0	2	22	0	2	10	117	**19**	**100**
NuwaraEliya	3	58	2	31	0	0	0	0	0	9	0	31	0	25	0	1	0	0	9	43	0	4	0	0	**53**	**100**
Galle	70	695	0	14	0	7	0	0	0	10	42	326	0	23	0	0	0	0	8	128	0	5	0	1	**31**	**100**
Hambantota	69	438	0	1	0	1	1	1	0	8	8	87	5	40	0	9	0	0	6	55	2	11	18	187	**31**	**100**
Matara	31	575	0	7	2	4	0	0	0	5	12	210	1	17	0	2	0	0	3	89	0	7	8	58	**49**	**100**
Jaffna	53	1154	3	36	0	1	0	5	0	8	1	7	3	426	0	1	0	1	3	93	1	2	0	2	**59**	**93**
Kilinochchi	2	53	0	3	0	0	0	0	0	15	0	6	0	4	0	0	0	0	0	5	0	0	0	0	**18**	**97**
Mannar	3	40	0	5	0	0	0	1	0	0	1	22	0	4	0	0	0	0	0	1	0	2	0	0	**16**	**100**
Vavuniya	1	67	0	5	0	1	0	0	0	0	0	18	0	6	0	1	0	0	1	9	0	1	0	2	**0**	**94**
Mullaitivu	4	35	0	8	0	0	0	2	0	11	0	18	0	3	0	0	0	0	0	5	0	0	0	3	**23**	**97**
Batticaloa	114	1043	2	64	0	6	0	4	0	7	4	32	0	1	0	3	0	0	1	25	0	12	0	0	**42**	**100**
Ampara	1	40	0	1	0	1	0	0	0	0	1	12	0	0	0	1	0	0	0	17	0	7	0	2	**16**	**57**
Trincomalee	156	1038	0	3	0	1	0	0	0	4	5	26	0	9	0	0	0	0	2	18	2	6	0	1	**23**	**98**
Kurunegala	59	998	0	13	0	6	0	0	0	0	9	90	0	7	0	7	0	1	6	204	1	57	5	129	**21**	**98**
Puttalam	30	2048	0	4	0	1	0	0	0	0	0	11	0	6	0	1	0	0	0	50	1	17	1	9	**15**	**92**
Anuradhapur	7	192	0	1	0	0	0	1	0	1	7	129	0	23	0	2	0	0	5	92	3	13	16	177	**20**	**96**
Polonnaruwa	52	1197	2	24	2	6	0	0	0	0	1	14	0	0	0	0	0	0	3	21	0	10	0	0	**38**	**100**
Badulla	16	243	0	5	0	4	0	0	0	6	10	66	0	5	1	8	0	0	5	35	0	9	2	150	**28**	**100**
Monaragala	23	449	1	12	0	3	0	0	12	18	10	109	4	22	3	43	0	0	3	62	4	16	0	7	**62**	**100**
Ratnapura	37	174	1	11	0	3	0	0	0	0	30	248	2	25	2	12	0	0	3	26	1	30	4	64	**23**	**100**
Kegalle	45	708	0	10	1	9	0	1	1	8	43	410	0	14	0	7	0	0	8	58	2	72	6	67	**34**	**100**
Kalmune	70	900	0	6	0	0	0	1	0	6	13	146	0	14	0	2	0	0	5	134	1	22	1	12	**29**	**98**
SRILANKA	**144**	**24554**	**13**	**296**	**5**	**68**	**2**	**22**	**13**	**142**	**26**	**2642**	**17**	**711**	**7**	**11**	**0**	**4**	**10**	**1619**	**24**	**384**	**72**	**1020**	**32**	**97**

Source: Weekly Returns of Communicable Diseases (esurvillance.epid.gov.lk). T=Timeliness refers to returns received on or before 21st April, 2023 Total number of reporting units 358 Number of reporting units data provided for the current week: 313 **C****-Completeness

Table 2: Vaccine-Preventable Diseases & AFP

15th– 21st Apr 2023(16th Week)

Disease	No. of Cases by Province									Number of cases during current week in 2023	Number of cases during same week in 2022	Total number of cases to date in 2023	Total number of cases to date in 2022	Difference between the number of cases to date in 2023 & 2022
	W	C	S	N	E	NW	NC	U	Sab					
AFP*	00	00	00	00	00	00	00	00	00	00	03	24	25	- 12 %
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Mumps	00	00	01	00	00	00	02	02	00	05	00	73	13	423.0 %
Measles	00	00	00	00	00	00	00	00	00	00	00	11	10	10 %
Rubella	00	00	00	00	00	00	00	00	00	00	00	01	00	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	01	01	0 %
Neonatal Tetanus	00	00	00	00	00	00	00	00	00	00	00	00	00	0 %
Japanese Enceph-alitis	00	00	00	00	00	00	00	00	00	00	00	02	01	100 %
Whooping Cough	00	00	00	00	00	00	00	00	00	00	01	03	01	200 %
Tuberculosis	58	06	35	02	09	14	08	03	24	159	00	2583	2265	14.0 %

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.

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

NA = Not Available

Number of Malaria Cases Up to End of April 2023,

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All are Imported!!!

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. Prior approval should be obtained from the Epidemiology Unit before publishing data in this publication**

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