WEEKLY EPIDEMIOLOGICAL REPORT

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Melioidosis (Part II)

This is the second in a series of two articles on Melioidosis and the first article described the causative agent, distribution and transmission of the disease. This article describes the clinical features, diagnosis, treatment, prevention and public health importance of the disease.

Clinical Features

B. pseudomallei can cause a wide spectrum of clinical diseases in man. While some infections are inapparent, others result in acute pulmonary disease, septicemia, or localized acute or chronic suppurative infections. The frequency of various syndromes can vary with the region; for example, parotid abscesses are common among children in Thailand, but rare in Australia. One syndrome can develop into another if the organisms spread to other sites.

Pulmonary disease is the most common form of melioidosis. It can occur as either the primary syndrome or as a component of septicemia. The symptoms usually include fever, coughing, pleuritic chest pain and in some cases, hemoptysis. Ulcerative lesions and nodules are sometimes found in the nose and the septum may perforate. Severe weight loss may be seen. Pulmonary signs can develop suddenly, or may occur gradually after a prodromal syndrome characterized by headache, anorexia and generalized myalgia. Complications include pneumothorax, empyema and pericarditis.

Untreated cases often progress to septicemia. Septicemia is the most serious form of melioidosis. It is most common in people with pre-existing diseases such as diabetes, cancer and kidney failure. The onset is usually acute with fever, rigors and other typical signs of sepsis. However, in some patients, septicemia may develop more gradually, with a fluctuating fever often associated with severe weight loss. Common symptoms of septicemic melioidosis include fever, severe headache, disorientation, pharyngitis, upper abdominal pain, diarrhoea, jaundice and notable muscle tenderness. Pulmonary signs including dyspnea are common and arthritis or meningitis may be seen. Some patients have a disseminated pustular rash with regional lymphadenopathy, cellulitis or lymphangitis. Septic shock is common, and it is usually fatal once it develops.

Chronic melioidosis is characterized by abscesses and suppurative lesions, which can occur in a variety of organs. Although the liver, spleen, skeletal muscle and prostate gland are affected most often, lesions can occur in any organ including the skin, lung, myocardium, bone, joints, lymph nodes and testes. Mycotic aneurysms are also seen. Rarely, melioidosis can result in brain abscesses, encephalomyelitis (often accompanied by flaccid paralysis) or meningitis. Fever may or may not be present in chronic melioidosis. Some infected patients remain asymptomatic for years. These chronic carriers may eventually develop clinical disease, typically when they become immunosuppressed from another condition

Acute localized infections sometimes occur at the site of inoculation. In the skin, these infections appear as gray or white firm nodules and ulcers. The nodules may caseate and are often surrounded by inflammation. Regional lymphadenopathy and lymphangitis may also be seen. Other forms of acute localized disease include suppurative parotitis/ parotid abscesses, corneal ulcers and cellulitis. Some infections may resemble necrotizing fasciitis. Genitourinary infections often manifest as prostatic abscesses. Localized infections can disseminate, but systemic infections are not always preceded by localized signs. Skin and subcutaneous infections can also result from the hematogenous spread of the organisms from other sites.

Contents

Diagnostic Tests

Melioidosis can be diagnosed by recovering *B. pseudomallei* from blood, sputum, throat swabs, tissues or wound exudates. In the septicemic form, blood cultures may be negative until just before death. The soil and/ or water may also be sampled during outbreaks. *B. pseudomallei* grows on most media including blood agar. Mature colonies often have a wrinkled form; these colonies may be mixed with smooth colonies. A few strains, which are usually isolated from human sputum samples, form mucoid colonies. *B. pseudomallei* colonies have a characteristic putrid, earthy odor. (Due to the risk of infection, directly sniffing the plates is dangerous and not recommended.) On microscopic examination, the organisms are motile, short Gram negative bacilli with bipolar or irregular staining in young cultures. *B. pseudomallei* can be identified by biochemistry or with latex agglutination tests to detect antigens. There are conflicting reports on the reliability of automated identification systems; however, some systems might misidentify *B. pseudomallei* as another organism. This is a particular concern in non-endemic areas where the isolation of *B. pseudomallei* is unexpected.

B. pseudomallei antigens can be identified directly in tissues, wound exudates or body fluids by direct immunofluorescence or latex agglutination. Antigen tests including enzyme-linked immunosorbent assays (ELISAs) have also been developed for the exotoxin and other bacterial components. PCR assays have been reported and may be able to differentiate *B. mallei* DNA from *B. pseudomallei*. Other genetic techniques used to distinguish these two organisms include PCR–restriction fragment length polymorphism, pulse-field gel electrophoresis, 16S rRNA sequencing, variable number tandem repeat polymorphism and multi-locus sequence typing (MLST). These specialized genetic techniques may be mainly available in research laboratories.

Serologic tests may be helpful in some circumstances, particularly when paired sera are available. In some endemic areas, most of the population is seropositive, which limits the value of single tests. However, a high single titer in the presence of clinical signs may be suggestive. Serologic tests include agglutination, indirect hemagglutination, immunofluorescence, ELISAs, dot immunoassay, immunoblotting (Western blotting) and the immunochromatographic test (ICT). Complement fixation is not used commonly . Cross-reactions can occur in serologic tests with closely related organisms including *B. mallei*, the causative agent of glanders and *B. cepecia*. False positives have also been reported from other Gram negative bacteria including *Legionella* spp.

Treatment

B. pseudomallei is variably susceptible to antibiotics; this organism is intrinsically resistant to many drugs. Long-term treatment may be necessary. Multiple drugs were generally used in the past, but some newer single antibiotics are equally effective (e.g. Ceftazidime, Imipenem, Meropenem, Doxycycline, Trimethoprim/ Sulfamethoxazole, Piperacillin, Amoxicillin-clavulanic Acid, Azlocillin, Ticarcillin-clavulanate, Ceftriaxone, Aztreonam). Pulmonary resection or drainage of abscesses is sometimes necessary. Relapses can occur after apparently successful treatment and lifelong monitoring is often recommended.

Prevention

B. pseudomallei is widely distributed in soil and standing water in endemic regions. People predisposing conditions (e.g. Diabetes, Liver disease, Renal disease, Thalassemia, Cancer or another immune-suppressing condition) should take special precautions to avoid skin contact with these sources. In addition, gloves and rubber boots are recommended for anyone doing agricultural work. Skin wounds including abrasions or burns should be promptly and thoroughly cleaned. A few outbreaks have been linked to contaminated drinking water supplies. Although small numbers of organisms may survive, chlorination of the water supply decreases the risk of infection. Because *B. pseudomallei* can be found in milk from infected ruminants, only pasteurized dairy products should be consumed. Veterinarians should take precautions to avoid exposure, including the use of gloves and protective clothing when working with infected animals or collecting diagnostic samples. People who process meat should also wear gloves and disinfect knives regularly. In endemic areas, infected carcasses intended for human consumption are condemned and destroyed.

Laboratory workers may be exposed in clinical samples from patients, even where melioidosis is not endemic. Practices such as sniffing opened culture plates should be discouraged. Post-exposure prophylaxis may be given after laboratory exposure to aerosols or contact with skin wounds or to people with risk factors for septicemia. In hospitals, ordinary precautions to prevent transmission in blood and body fluids should be taken. No vaccine is available.

Public health importance

Melioidosis can occur as sporadic cases or outbreaks. A few outbreaks have been linked to contaminated drinking water supplies. In one outbreak, the source was a container of contaminated hand washing detergent. Increased numbers of cases are seen after heavy rainfall or flooding. In Australia, the risk for septicemia peaks two weeks after the beginning of the summer rains. Melioidosis is an under diagnosed disease, because it mimics other diseases and because diagnostic facilities may be limited in some endemic areas. More than 70% of all cases of melioidosis occur in people who have other illnesses. The severity of the disease and the clinical signs are influenced by the strain of the organism, the host's immunity, the form of the disease and the dose of organisms. For example, acute suppurative parotiditis is common in children in Thailand and usually has a good prognosis. However, even when treatment is optimal, the case fatality rate for acute severe melioidosis is 30% to 47%. The case fatality rate is greater than 90% in untreated septicemia and 40-75% when it is treated. Once septic shock develops, the case fatality rate is approximately 95%. Although the mortality rate is influenced by the availability of health care, melioidosis is a significant disease even when treatment is optimal. In Australia, the mortality rate for all patients with melioidosis is close to 20%.

Source

Melioidosis, available from

www.cfsph.iastate.edu/Factsheets/pdfs/melioidosis.pdf

Compiled by Dr. Madhava Gunasekera of the Epidemiology Unit

Table 1: Vaccine-preventable Diseases & AFP

17th – 23rd December 2011 (51st 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	01	85	78	+ 09.0 %
Diphtheria	00	00	00	00	00	00	00	00	00	-	-	-	-	-
Measles	00	00	00	00	00	01	00	00	00	01	00	132	88	+ 50.0 %
Tetanus	00	00	00	00	00	00	00	00	00	00	00	25	23	+ 08.7 %
Whooping Cough	00	00	00	00	01	00	00	01	00	02	02	55	32	+ 71.9 %
Tuberculosis	69	32	05	13	14	00	00	00	19	152	205	9338	10027	- 06.9 %

Table 2: Newly Introduced Notifiable Disease

17th – 23rd December 2011 (51st 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	04	01	05	03	08	06	01	03	10	41	42	4159	3330	+ 24.9 %
Meningitis	02 CB=1 KL=1	00	02 MT=1 GL=1	00	00	04 KR=4	02 AP=2	00	00	10	08	882	1542	- 42.8 %
Mumps	11	06	09	02	14	06	09	03	08	68	15	3362	1235	+ 172.2%
Leishmaniasis	00	00	03 MT=1 HB=2	00	00	00	03 AP=03	00	00	06	02	913	403	+ 126.5 %

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

17th – 23rd December 2011 (51st 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	338	9843	2	185	0	8	2	337	3	67	2	501	0	8	0	71	0	2	**100**
Gampaha	41	4079	1	136	1	20	2	104	0	85	2	533	1	27	7	398	0	6	**47**
Kalutara	39	1379	1	163	0	10	3	90	0	26	6	397	1	5	1	3	0	1	**92**
Kandy	74	1563	6	401	0	7	3	44	0	40	1	189	2	106	1	60	0	0	**87**
Matale	10	355	2	215	0	4	2	39	0	27	4	169	0	17	0	13	0	0	**100**
Nuwara	5	251	2	330	0	4	1	62	0	154	0	53	1	70	0	34	0	1	**92**
Galle	25	851	2	113	0	8	0	34	0	28	10	246	0	46	0	11	0	5	**89**
Hambantota	4	406	3	79	0	4	0	5	1	33	2	506	2	67	0	17	0	2	**75**
Matara	51	772	4	105	0	3	0	24	0	36	5	384	3	95	1	31	0	1	**94**
Jaffna	10	383	6	449	0	4	18	363	0	92	0	3	28	284	1	38	0	1	**100**
Kilinochchi	0	60	0	41	0	3	1	19	0	14	0	2	0	13	0	3	0	0	**75**
Mannar	18	89	0	47	0	1	1	38	0	83	0	14	2	39	0	2	0	0	**80**
Vavuniya	2	79	1	48	0	18	1	15	0	60	0	54	0	2	0	3	0	0	**75**
Mullaitivu	0	19	2	72	0	1	0	7	0	9	0	9	0	2	0	3	0	0	**100**
Batticaloa	105	1447	4	597	0	5	0	7	0	32	1	26	0	3	0	2	1	10	**71**
Ampara	3	175	0	262	0	1	0	14	0	55	1	66	0	2	0	12	0	0	**43**
Trincomalee	4	173	14	712	0	2	2	14	0	13	0	104	0	9	0	9	0	1	**83**
Kurunegala	18	990	5	385	0	15	4	103	0	94	7	1572	0	78	1	78	0	4	**91**
Puttalam	20	544	1	200	1	3	0	36	0	51	2	124	2	21	0	12	0	2	**58**
Anuradhapu	3	286	1	164	0	2	0	8	0	36	4	254	0	17	0	31	0	1	**68**
Polonnaruw	1	298	1	127	0	1	0	17	0	22	1	87	1	3	0	26	0	0	**71**
Badulla	7	626	4	403	0	6	0	60	0	24	2	84	0	90	0	70	0	0	**88**
Monaragala	4	302	1	150	0	5	0	48	0	14	4	193	1	78	1	98	0	0	**73**
Ratnapura	30	1095	12	507	0	9	0	61	0	44	5	623	0	30	0	86	0	2	**56**
Kegalle	20	1032	0	119	0	14	1	84	0	25	3	361	0	37	13	360	0	0	**73**
Kalmune	10	56	16	658	0	2	0	6	0	108	0	7	0	2	0	6	0	1	**69**
SRI LANKA	**841**	**27162**	**91**	**6668**	**02**	**160**	**41**	**1639**	**04**	**1272**	**62**	**6564**	**44**	**1151**	**26**	**1497**	**01**	**40**	**80**

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 23th December, 2011 Total number of reporting units =329. Number of reporting units data provided for the current week: 261
A = Cases reported during the current week. **B** = Cumulative cases for the year.

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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.**

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