

BÖLÜM

66

ZOONOTİK HASTALIKLAR

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Zoonotik hastalıklar (zoonozlar), hayvanlardan insanlara direkt veya dolaylı olarak bulaşan enfeksiyon hastalıkları grubunu tanımlamaktadır. Önemi her geçen gün artan hastalık grubunun oluşumunu etkileyen birçok faktör vardır. Etken organizmaların yaşam döngüsünü etkileyen kesin konak veya ara konak hayvanların ihtiyaç duyduğu iklim koşulları, coğrafik şartlar hastalığın dünya genelinde yayılımını belirleyen özelliklerdendir. Öte yandan gelişen teknoloji, seyahat kolaylığı, artan küresel ticaret hastalığın yayılmasını belirleyen önemli faktörlerdendir. Bu gruptaki hastalıklardan bir bölümü biyolojik silah olarak kullanım açısından önem taşımaktadır.

Zoonotik hastalıklardan korunma ve kontrol bireysel tedbirlerin yanında multidisipliner bir yaklaşım gerektirir. Zoonotik hastalıkların kontrolü ancak farklı meslek gruplarının ortak çalışmaları sonucu sağlanabilir.

LYME HASTALIĞI

Spiroketlerden olan *Borrelia burgdorferi*'nin etken olduğu Lyme hastalığı, vektörler aracılığıyla bulaşmakta ve ülkemizde de görülebilmektedir^{1,2}. Hastalık *Ixodes* cinsi keneler ile taşınan bakteriyel bir hastalıktır^{3,4}. Hastalığın görülme dönemleri, kenelerin en çok aktif olduğu, Mayıs-Haziran ve Ekim-Kasım aylarıdır.

Lyme Hastalığı 3 Evrede Değerlendirilir

1. Erken Lokalize Evre; İnkubasyon periyodu 3 ile 32 gün arasındadır⁵. Kene tarafından ısırılma sonrası günler içinde (7-14 gün) hastaların % 60-80'inde döküntü (Eritema Chronicum Migrans) görülür. Bu döküntü kırmızı, yavaşça genişleyen boğa gözü şeklinde görülür. Lezyon ısırık etrafında küçük, kırmızı bir papül olarak başlar ve lezyonun çapı 70 cm'ye kadar ulaşabilir⁶. Bu evrede döküntü ile beraber, sistemik semptomlar da (ateş, üşüme ile birlikte yorgunluk, kas ağrısı, eklem ve baş ağrısı) bulunabilir. Muayene bulgularında, bölgesel adenopati ve ısırık bölgesinden farklı bölgelerde cilt lezyonları görülebilir. Tedavi edilmeyen olgularda cilt bulguları dışındaki en sık tutulum eklemler, sinir sistemi ve kardiyovasküler sistemdir⁷⁻¹¹.

2. Erken Yaygın Evre; kene ısırığından itibaren günler-aylar içinde ortaya çıkar. Birçok sistemi de içeren semptomlarla birlikte görülebilir. Bu olgularda eritema kronikum migrans görülmeyebilir. Yine bu olgulara nörolojik semptomlar eşlik edebilir (lenfositik menenjit, sıklıkla Bell palsi gibi kraniyel sinir palsileri, azalmış duyu, güçsüzlük ve refleks yokluğu)^{12,13}. Artralji, bitkinlik, çarpıntı, atriyoventriküler bloklar ve orta derecede peri/miyokardit görü-

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Cerrahi tedaviye kontrendikasyon oluşturan durumlar arasında karmaşık veya yaygın tutulum, ileri hasta yaşı, gebelik, komorbiditeler, ulaşılması zor çoklu kistler, kısmen inaktif veya kalsifiye karaciğer kistleri veya hastanın cerrahi reddetmesi yer alır^{8,12}. Cerrahi uygulanmayan ya da kontrendike durumlarında medikal tedavide en az üç ay (siklus) boyunca albendazol (2 x400 mg oral 4 hafta verilir 2 hafta tedavi durdurulur) veya mebendazol (günde 40-50 mg /kg oral) ilk seçilecek ilaçlardır⁸.

BATI NİL ATEŞİ

Batı Nil Ateşi (BNA) etkeni *Flavivirus* cinsinin *Flaviviridae* ailesine ait *Batı Nil Virüsü*'dür¹. İnsanlara bulaşın en yaygın şekli sivrisinekler (özellikle *Culex* türü) aracılığıyla gerçekleşir. Bunun yanımdan, organ, doku nakli, ve plasental yol ile bulaş olduğu da saptanmıştır^{2,3}. Dünyada yaygın bir dağılım gösteren hastalık Afrika, Avrupa, Asya, Kuzey Amerika, Avustralya ve Orta Doğu'da görülebilmektedir⁴. Hastalığın kuluçka süresi 2 ile 14 gün arasında değişmektedir². BNA enfekte kişilerin % 20 ile 25'inde klinik saptanır^{5,6,7}. Halsizlik, ateş, baş ağrısı, yaygın kas ağrıları ve daha nadir olarak gastrointestinal semptomlar ile artralji görülür^{7,8}. Hastaların % 1'inden azında ensefalit, menenjit, flask paralizi gibi santral sinir sistemi tutulumu görülür⁸. Tanı için hastanın serum veya beyin omurilik sıvısında virüse karşı oluşan immunoglobulin M antikorları veya PCR testi kullanılır⁹. Etkili bir antiviral tedavisi bulunmamaktadır. Destek tedavisi önerilir¹⁰.

KAYNAKLAR

1. Shapiro ED. *Borrelia burgdorferi* (Lyme disease). *Pediatr Rev*. 2014 Dec;35(12):500-9
2. Chomel B. Lyme disease. *Rev Sci Tech* 2015;34:569-76
3. Bernard Q, Thakur M, Smith AA et al. *Borrelia burgdorferi* protein interactions critical for microbial persistence in mammals. *Cell. Microbiol*. 2019 Feb;21(2):e12885
4. Muhammad S, Simonelli RJ. Lyme Carditis: A Case Report and Review of Management. *Hosp Pharm*. 2018 Jul;53(4):263-265

5. Smith RP et al: Clinical characteristics and treatment outcome of early Lyme disease in patients with microbiologically confirmed erythema migrans. *Ann Intern Med*. 136(6):421-8, 2002
6. DePietropaolo DL, Powers JH, Gill JM, et al. Diagnosis of lyme disease [published correction appears in *Am Fam Physician*. 2006;73(5):776]. *Am Fam Physician*. 2005;72(2):297-304
7. Tibbles CD, Edlow JA. Does this patient have erythema migrans? *JAMA*. 2007;297(23):2617-2627
8. Bratton RL, Whiteside JW, Hovan MJ et al. Diagnosis and treatment of Lyme disease. *Mayo Clin Proc*. 2008;83(5):566-571.
9. Wormser GP, Brisson D, Liveris D, et al. *Borrelia burgdorferi* genotype predicts the capacity for hematogenous dissemination during early Lyme disease. *J Infect Dis*. 2008;198(9):1358-1364
10. Bacon RM, Kugeler KJ, Mead PS; Centers for Disease Control and Prevention (CDC). Surveillance for Lyme disease—United States, 1992–2006. *MMWR Surveill Summ*. 2008;57(10):1-9
11. Aucott J, Morrison C, Munoz B et al. Diagnostic challenges of early Lyme disease: lessons from a community case series. *BMC Infect Dis*. 2009;9:79.
12. Barker SC, Murrell A. Systematics and evolution of ticks with a list of valid genus and species names. *Parasitology*. 2004; 129(7):15-36
13. Furman DP, Loomis EC. The ticks of California (Ascar: Ixodida). University of California Publications. Bulletin of the California Insect Survey. 1984; 25: 1-239
14. Murray TS, Shapiro ED. Lyme disease. *Clin Lab Med*. 2010;30(1):311-328
15. van der Linde MR. Lyme carditis: clinical characteristics of 105 cases. *Scand J Infect Dis Suppl*. 1991;77:81-84
16. Sigal LH. Early disseminated Lyme disease: cardiac manifestations. *Am J Med*. 1995;98(4A):25S-28S, discussion 28S-29S
17. Wormser GP et al: The clinical assessment, treatment, and prevention of lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the Infectious Diseases Society of America. *Clin Infect Dis*. 43(9):1089-134, 2006
18. Steere AC, Schoen RT, Taylor E. The clinical evolution of Lyme arthritis. *Ann Intern Med*. 1987;107(5):725-31
19. Halperin JJ. Nervous system Lyme disease. *Handb Clin Neurol*. 2014;121:1473-83
20. Steere AC, Strle F, Wormser GP et al. (2016) Lyme borreliosis. *Nat Rev Dis Primer* 2: 16090
21. Beers MH, Berkow R. The Merck manual of diagnosis and therapy. 17th ed. Merck Research Laboratories. Whitehouse Station, n.J, 1999
22. Spach DH, Liles WC, Campbell GL et al. Tick-borne diseases in the United States. *N Engl J Med*. 1993; 329: 936-47

23. Chiou HE, Liu CI, Buttrey MJ, et al. Adverse effects of ribavirin and outcome in severe acute respiratory syndrome: experience in two medical centers. *Chest*. 2005; 128: 263-72.
24. Ellis J, Oyston PC, Green M, Titball RW. Tularemia. *Clin Microbiol Rev*. 2002; 15(4): 631-46
25. WHO(2007). Guidelines on Tularaemia. Geneva: World Health Organization (last access 2 march 2020 https://www.who.int/csr/resources/publications/WHO_CDS_EPR_2007_7.pdf?ua=1)
26. Sjöstedt A. Tularemia: history, epidemiology, pathogen physiology, and clinical manifestations. *Ann N Y Acad Sci*. 2007; 1105: 1-29
27. Kılıç S. Francisella tularensis ve Türkiye'de tularemi epidemiyolojisine genel bir bakış. *Flora*. 2010; 15(2): 37-58
28. Penn RL. Francisella tularensis (tularemia). In: Mandell GL, Bennett JE, Dolin R, eds. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases*. 6th ed. Philadelphia: Churchill Livingstone, 2005: 2674-85
29. Tärnvik A, Berglund L. Tularemia. *Eur Respir J*. 2003; 21(2): 361- 73
30. Hepburn MJ, Simpson AJ. Tularemia: current diagnosis and treatment options. *Expert Rev Anti Infect Ther*. 2008; 6(2): 231-40
31. Enderlin G, Morales L, Jacobs RF et al. Streptomycin and alternative agents for the treatment of tularemia: review of the literature. *Clin Infect Dis*. 1994; 19(1): 42-7
32. Belman AL. Tick-borne diseases. *Semin Pediatr Neurol*. 1999; 6: 249-66
33. Everett, E. D., Evans K.A, Henry R. B. et al. 1994. Human ehrlichiosis in adults after tick exposure: diagnosis using polymerase chain reaction. *Ann. Intern. Med.* 120:730-735
34. Fishbein D.B, Dawson J. E. Robinson L. E. 1994. Human ehrlichiosis in the United States, 1985 to 1990. *Ann. Intern. Med.* 120:736-743
35. Walker DH. Tick-transmitted infectious diseases in the United States. *Annu Rev public Health* 1998; 19: 237-69
36. Fritz CL, Glaser CA. Erlichiosis. *Infect Dis Clin North Am*. 1998; 12: 123-36.
37. Dumler JS, Madigan JE, Pusterla N, et al. Ehrlichiosis in humans: epidemiology, clinical presentation, diagnosis, and treatment. *Clin Infect Dis*. 2007;4(1):S45-51
38. Im JH, Baek J, Durey A et al. Current Status of Tick-Borne Diseases in South Korea. *Vector Borne Zoonotic Dis*. 2019 Apr;19(4):225-233
39. Khamesipour F, Dida GO, Anyona DN et al. Tick-borne zoonoses in the Order Rickettsiales and Legionellales in Iran: A systematic review. *PLoS Negl Trop Dis*. 2018 Sep;12(9):e0006722
40. Pujalte GGA, Marberry ST, Libertin CR. Tick-Borne Illnesses in the United States. *Prim. Care*. 2018 Sep;45(3):379-391
41. Eisen RJ, Eisen L. The Blacklegged Tick, Ixodes scapularis: An Increasing Public Health Concern. *Trends Parasitol*. 2018 Apr;34(4):295-309.
42. Ricketts HT. Some aspects of Rocky Mountain spotted fever as shown by recent investigations. *Med Rec*. 1909;16843- 855
43. CDC. Rocky Mountain Spotted Fever: Signs and Symptoms. CDC website. Updated February 19, 2019. Accessed March 03, 2020. <https://www.cdc.gov/rmsf/healthcare-providers/signs-symptoms.htm>
44. Blanton LS. The rickettsioses: a practical update. *Infect Dis Clin North Am*. 33(1):213-29, 2019
45. Bleck TP. Central nervous system involvement in Rickettsial diseases. *Neurol Clin*. 17(4):801-12, 1999
46. Thorner AR, Walker DH, Petri WA Jr. Rocky mountain spotted fever. *Clin Infect Dis*. 1998; 27: 1353-60
47. Biggs HM et al. Diagnosis and management of tick-borne rickettsial diseases: Rocky Mountain spotted fever and other spotted fever group rickettsioses, ehrlichiosis, and anaplasmosis - United States. *MMWR Recomm Rep*. 65(2):1-44, 2016
48. Abdad MY et al. A concise review of the epidemiology and diagnostics of rickettsioses: Rickettsia and Orientia spp. *J Clin Microbiol*. 56(8): e01728-817, 2018
49. Walker DH, Raoult D. Rickettsia rickettsii and other spotted fever group rickettsiae (Rocky Mountain spotted fever and other spotted fevers). In: Mandell GL, Douglas RG, Bennett JE Dolin R, eds. *Mandell, Douglas and Bennett's Principles and practice of infectious diseases*. 5th ed. Philadelphia. Churchill Livingstone, 2000, p. 2393-402
50. Taeye AJ. Tick trouble: overview of tick-borne diseases. *Cleve Clin J Med*. 2000; 67: 245-9
51. Vannier EG et al: Babesiosis. *Infect Dis Clin North Am*. 29(2):357-70, 2015
52. Vannier EG et al: Human babesiosis. *Infect Dis Clin North Am*. 22(3):469-88, viii-ix, 2008
53. Krause PJ: Human babesiosis. *Int J Parasitol*. 49(2):165-74, 2019
54. Parija SC et al: Diagnosis and management of human babesiosis. *Trop Parasitol*. 5(2):88-93, 2015
55. Sanchez E et al. Diagnosis, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: a review. *JAMA*. 315(16):1767-77, 2016
56. Vannier E et al. Babesia species. In: Bennett JE et al, eds: *Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases*. 9th ed. Philadelphia, PA: Elsevier; 2020:3400-9.e2
57. Kingry LC, Anacker M, Pritt B, et al: Surveillance for and discovery of . *Clin Infect Dis* 2018; 66: pp. 1864-1871
58. Southern PM, and Sanford JP: Relapsing fever: a clinical and microbiological review. *Medicine (Baltimore)* 1969; 48: pp. 129-149

59. Dworkin MS, Anderson DE, Schwan TG, et al: Tick-borne relapsing fever in the Northwestern United States and Southwestern Canada. *Clin Infect Dis* 1998; 26: pp. 122
60. Nuhoglu I, Aydın M, Türedi S. Kene İle Bulaşan Hastalıklar. *TAF Prev Med Bull* 2008; 7(5):461-468
61. Hartskeerl RA, Collares-Pereira M, Ellis WA. Emergence, control and re-emerging leptospirosis: dynamics of infection in the changing world. *Clin Microbiol Infect* 2011; 17:494
62. Marquez A, Djelouadi Z, Lattard V, Kodjo A. Overview of laboratory methods to diagnose Leptospirosis and to identify and to type leptospire. *Int Microbiol* 2017; 20:184
63. Trevejo RT, Rigau-Perez JG, Ashford DA, et al: Epidemic leptospirosis associated with pulmonary hemorrhage-Nicaragua, 1995. *J Infect Dis* 1998; 178: pp. 1457-1463
64. Torgerson PR, Hagan JE, Costa F, et al: Global burden of leptospirosis: estimated in terms of disability adjusted life years. *PLoS Negl Trop Dis* 2015; 9: pp. e0004122
65. Edwards GA, and Domm BM: Human leptospirosis. *Medicine (Baltimore)* 1960; 39: pp. 117-156
66. Feigin RD, and Anderson DC: Human leptospirosis. *CRC Crit Rev Clin Lab Sci* 1975; 5: pp. 413-467
67. Turner LH: Leptospirosis. I. *Trans R Soc Trop Med Hyg* 1967; 61: pp. 842-855
68. Berman SJ, Tsai CC, Holmes K, et al. Sporadic anicteric leptospirosis in South Vietnam. A study in 150 patients. *Ann Intern Med* 1973; 79:167
69. Daher Ede F, Zanetta DM, Abdulkader RC. Pattern of renal function recovery after leptospirosis acute renal failure. *Nephron Clin Pract* 2004; 98:c8
70. Assimakopoulos SF, Fligou F, Marangos M, et al. Anicteric leptospirosis-associated severe pulmonary hemorrhagic syndrome: a case series study. *Am J Med Sci* 2012; 344:326
71. Parsons M: Electrocardiographic changes in leptospirosis. *Br Med J* 1965; 2: pp. 201-203
72. Ko AI, Galvao Reese M, Ribeiro Durado CM, et al: Urban epidemic of severe leptospirosis in Brazil. *Lancet* 1999; 354: pp. 820-825
73. Stefanos A, Georgiadou SP, Gioti C, et al. Leptospirosis and pancytopenia: two case reports and review of the literature. *J Infect* 2005; 51:e277
74. Vijayachari P, Sugunan AP, et al: Evaluation of dark-ground microscopy as a rapid diagnostic procedure in leptospirosis. *Indian J Med Res* 2001; 114: pp. 54-58
75. Ahmed A, Grobusch MP, Klatser P, et al: Molecular approaches in the detection and characterization of . *J Bacteriol Parasitol* 2011
76. World Health Organization : Human Leptospirosis: Guidance for Diagnosis, Surveillance and Control. Geneva: WHO, 2003
77. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases 2020; *Leptospira* Species (Leptospirosis), 239,2898-2905
78. McClain JBL, Ballou WR, Harrison SM, et al: Doxycycline therapy for leptospirosis. *Ann Intern Med* 1984; 100: pp. 696-698
79. Panaphut T, Domrongkitchaiporn S, Vibhagool A, et al: Ceftriaxone compared with sodium penicillin G for treatment of severe leptospirosis. *Clin Infect Dis* 2003; 36: pp. 1507-1513
80. Cultuer SJ, Whatmore AM, Commander NJ. Brucellosis- new aspects of an old disease. *J Appl Microbiol*. 2005;98:1270-81.
81. Mantur BG, Amarnath S. Brucellosis in India. *J Biosci*. 2008;33:539-47.
82. Cloeckaert A, Grayon M, Grepinet O, Boumedine KS. Classification of *Brucella* stains isolated from marine mammals by infrequent restriction site -PCR and development of specific PCR identification tests. *Microbes Infect*. 2003;5:593-602.
83. Eckman MR. Brucellosis linked to Mexican cheese. *JAMA* 1975;232:636-7.
84. Malik GM. A clinical study of brucellosis in adults in the Asir region of southern Saudi Arabia. *Am J Trop Med Hyg* 1997;56:375-7.
85. Glass WI. Brucellosis as an occupational disease in New Zealand. *N Z Med J* 1964;63:301-8.
86. Williams E. Brucellosis and the British public. *Lancet* 1970;1:1220-2.
87. Corbel MJ, World Health Organization. Brucellosis in Humans and Animals (1. Baskı). World Health Organization, Cenevre, 2007.
88. Franco MP, Mulder M, Gilman RH ve diğ. Human brucellosis. *Lancet Infect Dis*. 2007;7(12):775-786.
89. Mantur BG, Amarnath SK, Shinde RS. Review of clinical and laboratory features of human brucellosis. *Indian J Med Microbiol*. 2007;25(3):188-202.
90. Yagupsky P. Pediatric brucellosis: an (almost) forgotten disease. *Adv Exp Med Biol*. 2011;719:123-132.
91. American Academy of Pediatrics. Brucellosis. Red Book: 2012 Report of the Committee on Infectious Diseases, 29. Baskı, LK Pickering, CJ Baker, A Kimberlin, W David, SS Long (Ed), Elk Grove Village. American Academy of Pediatrics, 2012; s. 256-258.
92. Gul HC, Erdem H. Brucellosis (*Brucella* species). In: Bennett JE, Dolin R, Blaser MJ, eds. Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases. 8th ed. Philadelphia, PA: Elsevier Saunders, 2015: 2584-9.
93. BuzganT, Karahocagil MK, Irmak H, et al. Clinical manifestations and complications in 1028 cases of brucellosis: a retrospective evaluation and review of the literature. *Int J Infect Dis*. 2010; 14(6): e469-78.
94. Pappas G, Akritidis N, Bosilkovski M, Tsianos E. Brucellosis. *N Engl J Med* 2005;352(22): 2325-36.

95. Aygen B, Doganay M, Sumerkan B, Yildiz O, Kayabas U. Clinical manifestations, complications and treatment of brucellosis: a retrospective evaluation of 480 patients. *Med Mal Infect* 2002;32:485-93.
96. Doganay M, Aygen B. Human brucellosis: an overview. *Int J Infect Dis* 2003;7(3):173-82.
97. Colmenero JD, Ruiz-Mesa JD, Plata A, Bermúdez P, Martín-Rico P, Queipo-Ortuño MI, et al. Clinical findings, therapeutic approach, and outcome of brucellar vertebral osteomyelitis. *Clin Infect Dis* 2008;46(3):426-33.
98. Sümerkan B. *Brucella türleri*. In: Willke TA, Söyletir G, Doğanay M, eds. *İnfeksiyon Hastalıkları ve Mikrobiyolojisi*, 2. baskı. İstanbul: Nobel Tıp Kitabevleri, 2002:1647-52.
99. Ariza J, Servitje O, Pallarés R, Fernández Viladrich P, Rufi G, Peyrí J, et al. Characteristic cutaneous lesions in patients with brucellosis. *Arch Dermatol* 1989;125(3):380-3.
100. Mantur BG, Mangalgi SS. Evaluation of conventional castaneda and lysis centrifugation blood culture techniques for diagnosis of human brucellosis. *J Clin Microbiol* 2004;42(9):4327-8.
101. Ulu-Kilic A, Metan G, Alp E. Clinical presentations and diagnosis of brucellosis. *Recent Patents Anti-Infect Drug Disc.* 2013;8(1):34-41.
102. Martín Moreno S, Guinea Esquerdo L, Carrero González P, et al. (1992) Diagnosis of brucellosis in an endemic area. Evaluation of routine diagnostic tests. *Medicina Clinica (Barcelona)* 98: 481- 485.
103. Alp E, Doganay M. Current therapeutic strategy in spinal brucellosis. *Int J Infect Dis* 2008;12(6):573-7.
104. Pappas G, Papadimitriou P, Christou L, Akritidis N. Future trends in human brucellosis treatment. *Expert Opin Investig Drugs* 2006;15(10):1141-9.
105. Pappas G, Akritidis N, Christou L. Treatment of neurobrucellosis: what is known and what remains to be answered. *Expert Rev Anti Infect Ther* 2007;5(6):983-90.
106. Siadat SD, Salmani AS, Aghasadeghi MR. Brucellosis Vaccines: An Overview. *Zoonosis Dr. Jacob Lorenzo-Morales (Ed), Rijeka. InTech*, 2012; s. 143-167.
107. Hugh-Jones M: 1996-97 Global Anthrax Report. *J Appl Microbiol*, 1999; 87: 189-91
108. Brachman PS: Bioterrorism: an update with a focus on anthrax. *Am J Epidemiol*, 2002; 155: 981-7 3. Mal'tseva AN: [The epidemiology and prevention of anthrax]. *Feldsher Akush*, 1990; 55: 10-4
109. Baillie L, Read TD. *Bacillus anthracis*: a bug with attitude. *Curr Opin Microbiol* 2001;4:78-81
110. Santelli E, Bankston LA, Leppla SH, Liddington RC. Crystal structure of a complex between anthrax toxin and its host cell receptor. *Nature*. 2004;430:905-908
111. Dixon TC, Meselson M, Guillemin J, Hanna PC. Anthrax. *N Engl J Med*. 1999;341:815-26
112. Watson A, Keir D: Information on which to base assessments of risk from environments contaminated with anthrax spores. *Epidemiol Infect*, 1994; 113: 479-90
113. Turnbull PC: Introduction: anthrax history, disease and ecology. *Curr Top Microbiol Immunol*, 2002; 271: 1-19 7. Hugh-Jones M: 1996-97 Global Anthrax Report. *J Appl Microbiol*, 1999; 87: 189-91
114. Swartz MN. Recognition and management of anthrax—an update. *N Engl J Med* 2001;345:1607-10
115. Pile JC, Malone JD, Eitzen EM, Friedlander AM. Anthrax as a potential biological warfare agent. *Arch Intern Med*. 1998;158(5):429-34.
116. Caksen H, Arabaci F, Abuhandan M, Tuncer O, Cesusur Y: Cutaneous anthrax in eastern Turkey. *Cutis*, 2001; 67: 488-92
117. Oncul O, Ozsoy MF, Gul HC, et al: Cutaneous anthrax in Turkey: a review of 32 cases. *Scand J Infect Dis*, 2002; 34: 413-6
118. Inglesby TV, Henderson DA, Bartlett JG, et al. Anthrax as a biological weapon: medical and public health management. Working Group on Civilian Biodefense. *JAMA*. 1999;281(18):1735-45
119. Edwards MS. Anthrax. In: Feigin RD, Cherry JD, eds. *Textbook of pediatric infectious diseases*, 3rd ed, Vol. 1. Philadelphia: WB Saunders, 1992: 1053-1056
120. Lew D. *Bacillus anthracis (anthrax)*. In: Mandell GL, Bennett JE, Dolin R, eds. *Principles and practices of infectious disease*. New York: Churchill Livingstone, 2000: 2215-2220
121. Doganay M, Bakir M, Dokmetas I. A case of cutaneous anthrax with toxæmic shock. *Br J Dermatol* 1987; 117: 659-662
122. Brachman PS, Kaufmann A. Anthrax. In: Evans AS, Brachman PS, eds. *Bacterial infections of humans*. New York: Plenum, 1998
123. Gold H. Anthrax: a report of one hundred seventeen cases. *Arch Intern Med* 1955; 96: 387-396
124. Lakshmi N, Kumar AG: An epidemic of human anthrax – a study. *Indian J Pathol Microbiol*, 1992; 35: 1-4
125. Sirisanthana T, Navachareon N, Tharavichitkul P, Sirisanthana V, Brown AE: Outbreak of oral-oro-pharyngeal anthrax: an unusual manifestation of human infection with *Bacillus anthracis*. *Am J Trop Med Hyg*, 1984; 33: 144-50
126. Kanafani ZA, Ghossain A, Sharara AI, Hatem JM, Kanj SS. Endemic gastrointestinal anthrax in 1960s Lebanon: clinical manifestations and surgical findings. *Emerg Infect Dis* 2003;9:520-525
127. Kamal SM et al: Anthrax: an update. *Asian Pac J Trop Biomed.*, 2011; 1(6):496-501.
128. Swartz MN: Recognition and management of anthrax – an update. *N Engl J Med*, 2001; 345: 1621-6.
129. Plotkin SA, Brachman PS, Utell M, et al: An epidemic of inhalation anthrax, the first in the twentieth century: I. Clinical features. 1960. *Am J Med*, 2002; 112: 4-12; discussion 2-3

130. Henry L: Inhalational anthrax: threat, clinical presentation, and treatment. *J Am Acad Nurse Pract*, 2001; 13: 164-8; quiz 169-70
131. Kuehnert MJ, Doyle TJ, Hill HA et al: Clinical features that discriminate inhalational anthrax from other acute respiratory illnesses. *Clin Infect Dis*, 2003; 36: 328-36
132. Miller JM: Agents of bioterrorism. Preparing for bioterrorism at the community health care level. *Infect Dis Clin North Am*, 2001; 15: 1127-56
133. Turnbull PC, Doganay M, Lindeque PM, et al: Serology and anthrax in humans, livestock and Etosha National Park wildlife. *Epidemiol Infect*, 1992; 108: 299-313
134. Harrison LH, Ezzell JW, Abshire TG, et al: Evaluation of serologic tests for diagnosis of anthrax after an outbreak of cutaneous anthrax in Paraguay. *J Infect Dis*, 1989; 160: 706-10
135. Shlyakhov E, Rubinstein E. Evaluation of the anthrax skin test for diagnosis of acute and past human anthrax. *Eur J Clin Microbiol Infect Dis* 1996; 15: 242-245.
136. Shlyakhov E, Rubinstein E, Novikov I. Anthrax post-vaccinal cell-mediated immunity in humans: kinetics pattern. *Vaccine* 1997; 15: 631-636.
137. Makino SI, Cheun HI, Watarai M, Uchida I, Takeshi K: Detection of anthrax spores from the air by real-time PCR. *Lett Appl Microbiol*, 2001; 33: 237-40
138. Hendricks KA, Wright ME, Shadomy SV, et al; Workgroup on Anthrax Clinical Guidelines. Centers for Disease Control and Prevention expert panel meetings on prevention and treatment of anthrax in adults. *Emerg Infect Dis* . 2014;20. doi:10.3201/eid2002.130687.
139. Auley JB, Jones JL, Singh K. *Manual of Clinical Microbiology*. 11th ed. Washington DC: ASM Press; 2014. *Toxoplasma*.
140. obert-Gangneux F, Darde ML. Epidemiology of and diagnostic strategies for Toxoplasmosis. *Clin Microbiol Rev*. 2012;25:264-96.
141. Black MW, Boothroyd JC. Lytic cycle of *Toxoplasma gondii*. *Microbiol Mol Biol Rev*. 2000;64:607-23.
142. Weiss LM et al: Toxoplasmosis: a history of clinical observations. *Int J Parasitol*. 39(8):895-901, 2009
143. Remington JS, McLeod R, Thulliez P, Desmonts G. Toxoplasmosis. In: Remington JS, Klein JO, Wilson CB, Baker CJ, editors. *Infectious diseases of fetus and newborn infant*, 6th ed. Philadelphia: Elsevier-Saunders Company, 2006 pp. 947-1091.
144. Weiss LM, Kim K. *Toxoplasma gondii*: the model apicomplexan: perspectives and methods. Illustrated ed. Academic Press; 2007 pp. 367-86.
145. Hill D et al: *Toxoplasma gondii*: transmission, diagnosis and prevention. *Clin Microbiol Infect*. 8(10):634-40, 2002
146. Hill DE, Chirukandoth S, Dubey J. Biology and epidemiology of *Toxoplasma gondii* in man and animals. *Anim Health Res Rev* 2005; 6: 41-61
147. Saadatnia G, Golkar M. A review on human toxoplasmosis. *Scand J Infect Dis* 2012; 44: 805-814.
148. Commodaro AG et al: Ocular toxoplasmosis: an update and review of the literature. *Mem Inst Oswaldo Cruz*. 104(2):345-50, 2009.
149. Dubey JP et al: *Toxoplasma gondii* infection in humans and animals in the United States. *Int J Parasitol*. 38(11):1257-78, 2008.
150. Jones JL et al: Congenital toxoplasmosis: a review. *Obstet Gynecol Surv*. 56(5):296-305, 2001.
151. Montoya JG, Liesenfeld O. Toxoplasmosis. *Lancet* 2004;363:1965-76.
152. Saadatnia G et al: A review on human toxoplasmosis. *Scand J Infect Dis*. 44(11):805-14, 2012.
153. Montoya JG: Laboratory diagnosis of *Toxoplasma gondii* infection and toxoplasmosis. *J Infect Dis*. 185 Suppl 1:S73-82, 2002.
154. CDC: DPDx - Laboratory Identification of Parasitic Diseases of Public Health Concern: Toxoplasmosis. CDC website. Updated December 18, 2017. Accessed March 03, 2020.
155. Paquet C et al: No. 285-toxoplasmosis in pregnancy: prevention, screening, and treatment. *J Obstet Gynaecol Can*. 40(8):e687-93, 2018.
156. Dubey JP: *Toxoplasmosis of Animals and Humans*. 2nd ed. Philadelphia, PA: CRC Press; 2009.
157. CDC: Parasites - Toxoplasmosis. Resources for Health Professionals. CDC website. Updated October 26, 2018. Accessed March 03, 2020. http://www.cdc.gov/parasites/toxoplasmosis/health_professionals/index.html#tx
158. US Department of Health and Human Services: Guidelines for the Prevention and Treatment of Opportunistic Infection in HIV-Infected Adults and Adolescents: *Toxoplasma Gondii* Encephalitis. AIDSinfo website. Updated July 25, 2017. Accessed March 03, 2020. <https://aidsinfo.nih.gov/guidelines/html/4/adult-and-adolescent-oi-prevention-and-treatment-guidelines/322/toxo>
159. Buttenschoen K, Carli Buttenschoen D. Echinococcus granulosus infection: the challenge of surgical treatment. *Langenbecks Arch Surg*. 2003;388:218-230.
160. Jenkins DJ, Romig T, Thompson RC: Emergence/re-emergence of *Echinococcus* spp. - a global update. *Int J Parasitol* 2005; 35:1205-19.
161. Agudelo Higuaita NI, Brunetti E, McCloskey C. Cystic echinococcosis. *J Clin Microbiol* 2016;54:518-23.
162. Pakala T, Molina M, George Wu GY. Hepatic echinococcal cysts: A review. *J Clin Transl Hepatol* 2016;4:39-46.
163. Symeonidis N, Pavlidis T, Baltatzis M, et al. Complicated liver echinococcosis: 30 years of experience from an endemic area. *Scand J Surg*. 2013;102:171-7.

164. Yagci G, Ustunsoz B, Kaymakcioglu N, et al. Results of surgical, laparoscopic, and percutaneous treatment for hydatid disease of the liver: 10 years experience with 355 patients. *World J Surg.* 2005;29:1670-9.
165. McManus DP, Zhang W, Li J, Bartley PB. Echinococcosis. *Lancet.* 2003 Oct 18;362(9392):1295-304.
166. Moro P et al: Echinococcosis: a review. *Int J Infect Dis.* 13(2):125-33, 2009. Brunetti E et al: Cestode infestations: hydatid disease and cysticercosis. *Infect Dis Clin North Am.* 26(2):421-35, 2012.
167. Brunetti E et al: Cestode infestations: hydatid disease and cysticercosis. *Infect Dis Clin North Am.* 26(2):421-35, 2012.
168. McManus DP et al: Diagnosis, treatment, and management of echinococcosis. *BMJ.* 344:e3866, 2012.
169. Santivanez S et al: Pulmonary cystic echinococcosis. *Curr Opin Pulm Med.* 16(3):257-61, 2010.
170. Brunetti E et al: Expert consensus for the diagnosis and treatment of cystic and alveolar echinococcosis in humans. *Acta Trop.* 114(1):1-16, 2010.
171. Bakoyiannis A et al: Rare cystic liver lesions: a diagnostic and managing challenge. *World J Gastroenterol.* 19(43):7603-19, 2013.
172. FJ, Davis CT, Tesh RB, Barrett AD olabilir. Batı Nil virüsünün filogeografisi. *J Virol.* 2011; 85 (6): 2964-2974.
173. Pealer LN, Marfin AA, Petersen LR, et al. Transmission of West Nile virus through blood transfusion in the United States in 2002. *N Engl J Med.* 2003;349(13):1236-1245.
174. Nett RJ, Kuehnert MJ, Ison MG, et al. Current practices and evaluation of screening solid organ donors for West Nile virus. *Transpl Infect Dis.* 2012;14(3):268-277.
175. Nash D, Mostashari F, Fine A, Miller J, O'Leary D, Murray K, Huang A, Rosenberg A, Greenberg A, Sherman M, Wong S, Layton M., 1999 West Nile Outbreak Response Working Group. The outbreak of West Nile virus infection in the New York City area in 1999. *N. Engl. J. Med.* 2001 Jun 14;344(24):1807-14.
176. Hayes EB et al: Virology, pathology, and clinical manifestations of West Nile virus disease. *Emerg Infect Dis.* 11(8):1174-9, 2005.
177. Petersen LR et al: West Nile virus: review of the literature. *JAMA.* 310(3):308-15, 2013.
178. Zou S et al: West Nile fever characteristics among viremic persons identified through blood donor screening. *J Infect Dis.* 202(9):1354-61, 2010.
179. Lindsey NP et al: Surveillance for human West Nile virus disease - United States, 1999-2008. *MMWR Surveill Summ.* 59(2):1-17, 2010.
180. CDC: Diagnostic Testing: West Nile Virus Antibody Testing. CDC website. Updated February 12, 2015. Reviewed December 10, 2018. Accessed March 03, 2020. <http://www.cdc.gov/westnile/healthcareproviders/healthcareproviders-diagnostic.html>
181. CDC: West Nile Virus Disease Therapeutics. Review of the Literature for Healthcare Providers. CDC website. Revised June 15, 2015. Accessed March 03, 2020. <https://www.cdc.gov/westnile/resources/pdfs/wnv-therapeutics-summary.pdf>