

KLEBSIELLOSIS

ANIMAL GROUP AFFECTED	TRANSMISSION	CLINICAL SIGNS	FATAL DISEASE ?	TREATMENT	PREVENTION & CONTROL
Pongidae, Hylobatidae, Cercopitheci- -dae, Cebidae, Prosimiae	Probably contact	Air sacculitis, bron- chopneumonia, meningitis, meningoence- phalitis, perito- nitis	Yes	Supportive (antibiotic resistance)	<i>In houses</i> <i>in zoos</i>

Fact sheet compiled by Manfred Brack, formerly German Primate Center, Göttingen / Germany.	Last update 22.11.2008
Susceptible animal groups All nonhuman primates.	
Causative organism <i>Klebsiella pneumoniae.</i> , particularly hypermucoviscosity phenotypes	
Zoonotic potential Theoretically yes.	
Distribution World-wide.	
Transmission Probably contact.	
Incubation period	
Clinical symptoms Air sacculitis, bronchopneumonia, meningitis, meningoencephalitis, arthritis, cystitis, abdominal abscesses, in New World monkeys primarily peritonitis.	
Post mortem findings Purulent to fibrinopurulent inflammation of affected organs, especially typhlitis, typhlocolitis with ulcerations and transmucosal abscesses, lymphonodular abscesses, pulmonary haemorrhages and microabscesses, Concomitant purulent hepatitis, myocarditis, osteomyelitis.	
Diagnosis Cultivation.	
Material required for laboratory analysis Altered tissues.	
Relevant diagnostic laboratories 1. Local veterinary and medical laboratories. 2. Konsiliarlaboratorium für Klebsiellen Institut für Medizinische Mikrobiologie und Virologie im Klinikum der Christian-Albrechts-Universität zu Kiel Brunswicker Str. 4 D 24905 KIEL Tel.: 0431 597 3305 " " 3300 Fax: " " 3296 e-mail: podschun@medmicrobio.uni-Kiel.de	
Treatment Supportive. <i>K.pneumoniae</i> is resistant to most antibiotics. The acquisition or production of plasmid-mediated extended-spectrum β -lactamases results in extensive resistance to cephalosporins (ceftazidime, ceftriaxone, aztreonam, cefuroxims), but can often be treated with a piperacillin/tazobactam combination	
Prevention and control in zoos Anti-capsular polysaccharide vaccine.	

Suggested disinfectant for housing facilities
Notification
Guarantees required under EU Legislation
Guarantees required by EAZA Zoos
Measures required under the Animal Disease Surveillance Plan
Measures required for introducing animals from non-approved sources
Measures to be taken in case of disease outbreak or positive laboratory findings
Conditions for restoring disease-free status after an outbreak
Experts who may be consulted 1. PD Dr. R. Podschun, Konsiliarlaboratorium Kiel, 2. Prof. Dr. U. Ullmann, “ “
References 1. Brack, M. 1987. Agents Transmissible from Simians to Man. Springer, Berlin. 2. Flügger, M., und J. Pfeiffer. 1992. Eine kommentierte Bibliographie zu den Erkrankungen der Lemuren. In: Ceska, V., H. – U. Hoffmann und K. H. Winkelstraeter (eds.) Lemuren im Zoo. Parey, Berlin. Pp. 273 – 303. 3. Gozalo, A., and E. Montoya. 1991. <i>Klebsiella pneumoniae</i> infections in a New World nonhuman primate center. Lab. Primate Newsl. 30 (2) : 13 – 14. 4. Kolodynski, J., R. Rolof, and A. Przondo – Mordarska. 1989. Antibiotic resistance and phage types of faecal <i>Klebsiella</i> isolated from healthy zoo apes. Arch. Immunol. Ther. Exp. 37 : 687 – 692. 5. Lee – Parritz, D. E., S. S. Snook, R. B. Russell, M. E. Ward, and E. M. Hajema. 1991. <i>Klebsiella pneumoniae</i> septicemia in cotton – topped tamarins. Am. Assoc. Lab. Anim. Sci. Bull. 30 (4) : 17. 6. Livermore, D. M., and M. Yuan. 1996. Antibiotic resistance and production of extended – spectrum β – lactamases amongst <i>Klebsiella</i> spp. from intensive care units in Europe. J. Antimicrob. Chemother. 38 . 409 – 424. 7. Lynn, M. J., B. L. Raphael, and P. L. McDonough. 1999. An outbreak of <i>Klebsiella pneumoniae</i> typhlitis in a captive group of silvery marmosets (<i>Callithrix argentata</i>). Am. Assoc. Zoo Vet. Annu. Conf. Proc. 1999 : 252 - 253 8. MacKenzie, F. M., K. J. Forbes, T. Dorai – John, S. G. Amyes, and I. M. Gould. 1997. Emergence of a carbapenem – resistant <i>Klebsiella pneumoniae</i> . Lancet 350 : 783. 9. Müller, R., und J. Nicolet. 1974. Klebsiellainfektionen bei Affen im Zoo Basel. Schweiz. Med. Wochenschr. 104 : 440. 10. Müller, R., D. Rüedi, und J. Nicolet. 1975. <i>Klebsiella</i> – Infektionen bei Affen und Halbaffen. Verh. ber. Erkr. Zootiere 117 : 293 – 296. 11. Obaldia, N.III. 1991. Detection of <i>Klebsiella pneumoniae</i> antibodies in <i>Aotus l. lemurinus</i> (Panamanian owl monkey) using enzyme – linked immunosorbent assay (ELISA) test. Lab. Anim. 25 : 133 – 141. 12. Postal, J. M., J. Gysin, and Y. Crenn: Protection against fatal <i>Klebsiella pneumoniae</i> sepsis in the squirrel monkey <i>Saimiri sciureus</i> after immunization with a capsular polysaccharide vaccine. Ann. Inst. Pasteur Immunol. 139 : 401 – 407. 13. Richard, C. 1989. Epidemiologie des infections a <i>Klebsiella pneumoniae</i> dans deux élevages de singes – écureuils et de lemuriens. Bull. Soc. Pathol. Exot. 82 : 458 – 464. 14. Solleveld, H. A., M. J. van Zwieten, P. J. Heidt, and P. M. C. A. van Eerd. 1984. Clinicopathologic study of six cases of meningitis and meningoencephalitis in chimpanzees (<i>Pan troglodytes</i>). Lab. Anim. Sci. 34 : 86 – 90. 15. Tagg, J. 1987. Pathology report. Dodo 24 : 128 – 13. 16. Twenhafel, N. A., C. A. Whitehouse, E. L. Stevens, H. E. Hottel, C. D. Foster, S. Gamble, S. Abbott, J. M. Janda, N. Kreiselmeyer, and K. E. Steele (2008). Multisystemic abscesses in African green monkeys (<i>Chlorocebus aethiops</i>) with invasive <i>Klebsiella pneumoniae</i> – identification of hypermucoviscosity phenotype . Vet.. Pathol. 45 : 226 – 231.