

REFERENCES

- Adler JL, Zickl R. Winter vomiting disease. *J Infect Dis.* 1969; 119(6):668-73.
- Akihara S, Phan TG, Nguyen TA, Yagyu F, Okitsu S, Muller WE, et al. Identification of sapovirus infection among Japanese infants in a day care center. *J Med Virol.* 2005; 77(4):595-601.
- Ando T, Jin Q, Gentsch JR, Monroe SS, Noel JS, Dowell SF, et al. Epidemiologic applications of novel molecular methods to detect and differentiate small round structured viruses (Norwalk-like viruses). *J Med Virol.* 1995; 47(2):145-52.
- Ando T, Noel JS, Fankhauser RL. Genetic classification of “Norwalk-like viruses”. *J Infect Dis* 2000; 181 (Suppl 2):S336-48.
- Appleton H, Higgins PG. Viruses and gastroenteritis in infants. *Lancet* 1975; 1:1297.
- Ashley CR, Caul EO, Paver WK. Astrovirus-associated gastroenteritis in children. *J Clin Pathol.* 1978; 31(10):939-43.
- Atmar RL, Estes MK. Diagnostic of noncultivable gastroenteritis viruses, the human caliciviruses. *Clin Microbiol Rev* 2001; 14(1):15-37.
- Barnes GL, Uren E, Stevens KB, Bishop RF. Etiology of acute gastroenteritis in hospitalized children in Melbourne, Australia, from April 1980 to March 1993. *J Clin Microbiol* 1998; 36(1):133-8.
- Barnes GL, Uren E, Stevens KB, Bishop RF. Etiology of acute gastroenteritis in hospitalized children in Melbourne, Australia, from April 1980 to March 1993. *J Clin Microbiol.* 1998; 36(1):133-8.

Belliot G, Laveran H, Monroe SS. Detection and genetic differentiation of human astroviruses: phylogenetic grouping varies by coding region. *Arch Virol*. 1997; 142(7):1323-34.

Belliot G, Lee T, Kurtz JL, Monroe S. Protein and genetic characterization of an astrovirus type 8. Abstracts of the American Society for Virology Meeting, Amherst, MA, 1999:176.

Bereciartu A, Bok K, Gomez J. Identification of viral agents causing gastroenteritis among children in Buenos Aires, Argentina. *J Clin Virol*. 2002; 25(2):197-203.

Bern C, Snizek J, Mathbor GM, Siddiqi MS, Ronsmans C, Chowdhury AM, et al. Risk factors for mortality in the Bangladesh cyclone of 1991. *Bull World Health Organ*. 1993; 71(1):73-8.

Bern CB, Glass RI. Impact of diarrheal disease worldwide. In: Kapikian AZ, editor. *Viral infections of the gastrointestinal tract*. New York: Marcel Dekker, 1994:1-26.

Bertolotti-Ciarlet A, Crawford SE, Hutson AM, Estes MK. The 3' end of Norwalk virus mRNA contains determinants that regulate the expression and stability of the viral capsid protein VP1: a novel function for the VP2 protein. *J Virol* 2003; 77(21):11603-15.

Billgren M, Christenson B, Hedlund KO, Vinje J. Epidemiology of Norwalk-like human caliciviruses in hospital outbreaks of acute gastroenteritis in the Stockholm area in 1996. *J Infect* 2002; 44:26-32.

Boga JA, Melon S, Nicieza I, De Diego I, Villar M, Parra F, et al. Etiology of sporadic cases of pediatric acute gastroenteritis in asturias, Spain, and

- genotyping and characterization of norovirus strains involved. *J Clin Microbiol* 2004; 42:2668-74.
- Bon F, Ambert-Balay K, Giraudon H, Kaplon J, Le Guyader S, Pommepuy M, et al. Molecular epidemiology of caliciviruses detected in sporadic and outbreak cases of gastroenteritis in France from December 1998 to February 2004. *J Clin Microbiol* 2005; 43(9): 4659-64.
- Buesa J, Collado B, Lopez-Andujar P, Abu-Mallouh R, Rodriguez Diaz J, Garcia Diaz A, et al. Molecular epidemiology of caliciviruses causing outbreaks and sporadic cases of acute gastroenteritis in Spain. *J Clin Microbiol* 2002; 40(8):2854-9.
- Centers for Disease Control and Prevention. An Outbreak of Norovirus Gastroenteritis at a Swimming Club --- Vermont, 2004 [Online]. Available: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5334a5.htm> [2005, May 3] 2004.
- Centers for Disease Control and Prevention. Norwalk-like viruses: public health consequences and outbreak management. *MMWR* 2001; 50:1-17.
- Centers for Disease Control and Prevention. Vessel sanitation program operations manual 2000. Atlanta: US Department of Health and Human Services, Centers for Disease Control and Prevention, 2000.
- Chiba S, Nakata S, Numata-Kinoshita K, Honma S. Sapporo virus: history and recent findings. *J Infect Dis* 2000; 181:S303-8.
- Chiba S, Sakuma Y, Kogasaka R, Akihara M, Horino K, Nakao T, et al. An outbreak of gastroenteritis associated with calicivirus in an infant home. *J Med Virol* 1979; 4:249-54.

- Chiba S, Sakuma Y, Kogasaka R, Akihara M, Terashima H, Horino K, et al. Fecal shedding of virus in relation to the days of illness in infantile gastroenteritis due to calicivirus. *J Infect Dis* 1980; 142:247-9.
- Chikhi-Brachet R, Bon F, Toubiana L, Pothier P, Nicolas JC, Flahault A, Kohli E. Virus diversity in a winter epidemic of acute diarrhea in France. *J Clin Microbiol*. 2002; 40(11):4266-72.
- Coluchi N, Munford V, Manzur J, Vazquez C, Escobar M, Weber E, et al. Detection, subgroup specificity, and genotype diversity of rotavirus strains in children with acute diarrhea in Paraguay. *J Clin Microbiol*. 2002; 40(5):1709-14.
- Cruz JR, Bartlett AV, Herrmann JE, Caceres P, Blacklow NR, Cano F. Astrovirus-associated diarrhea among Guatemalan ambulatory rural children. *J Clin Microbiol* 1992; 30: 1140-4.
- Cubitt WD, Jiang XJ, Wang J, Estes MK. Sequence similarity of human caliciviruses and small round structured viruses. *J Med Virol*. 1994; 43(3):252-8.
- Cubitt WD, Mitchell DK, Carter MJ, Willcocks MM, Holzel H. Application of electronmicroscopy, enzyme immunoassay, and RT-PCR to monitor an outbreak of astrovirus type 1 in a paediatric bone marrow transplant unit. *J Med Virol*. 1999 Mar;57(3):313-21.
- Cunliffe NA, Dove W, Gondwe JS, Thindwa BDM, Greensill J, Holmes JL, et al. Detection and characterization of human astroviruses in children with acute gastroenteritis in Blantyre, Malawi. *J Med Virol* 2002; 67:563-6.
- Dalton RM, Roman ER, Negredo AA, Wilhelmi ID, Glass RI, Sanchez-Fauquier A. Astrovirus acute gastroenteritis among children in Madrid, Spain. *Pediatr Infect Dis J*. 2002; 21(11):1038-41.

- de Wit MA, Koopmans MP, Kortbeek LM, van Leeuwen NJ, Vinje J, van Duynhoven YT. Etiology of gastroenteritis in sentinel general practices in the Netherlands. *Clin Infect Dis.* 2001; 33(3):280-8.
- Dolin R, Levy AG, Wyatt RG, Thornhill TS, Gardner JD. Viral gastroenteritis induced by the Hawaii agent. Jejunal histopathology and serologic response. *Am J Med.* 1975; 59:761-8.
- Dolin R, Reichman RC, Fauci AS. Lymphocyte populations in acute viral gastroenteritis. *Infect Immuno* 1976; 14: 422-8.
- Echeverria P, Burke DS, Blacklow NR, Cukor G, Charoenkul C, Yanggratoke S. Age-Specific Prevalence of antibody to rotavirus, Escherichia coli heat-labile enterotoxin, Norwalk virus, and hepatitis A virus in a rural community in Thailand. *J Clin Microbiol* 1983; 17:923-5.
- Echeverria P, Hoge CW, Bodhidatta L, Tungtaem C, Herrmann J, Imlarp S, et al. Etiology of diarrhea in a rural community in western Thailand: importance of enteric viruses and enterovirulent Escherichia coli. *J Infect Dis* 1994; 169:916-9.
- Estes MK. Rotavirus and their replication. In: Knipe DM, Howley PM, Griffin DE, Lamb RA, Martin MA, Roizman B, Straus SE, editors. *Fields virology.* 4th ed., vol 2. Philadelphia : Lippincott Williams & Wilkins, 2001:1747-85.
- Fankhauser RL, Monroe SS, Noel JS, Humphrey CD, Bresee JS, Parashar UD, et al. Epidemiologic and molecular trends of "Norwalk-like viruses" associated with outbreaks of gastroenteritis in the United States. *J Infect Dis.* 2002; 186(1):1-7.

Fankhauser RL, Noel JS, Monroe SS, Ando T, Glass RI. Molecular epidemiology of "Norwalk-like viruses" in outbreaks of gastroenteritis in the United States. *J Infect Dis.* 1998; 178(6):1571-8.

Farkas T, Zhong WM, Jing Y, Huang PW, Espinosa SM, Martinez N, et al. Genetic diversity among sapoviruses. *Arch Virol* 2004; 149:1309-23.

Foley B, O'Mahony J, Hill C, Morgan JG. Molecular detection and sequencing of "Norwalk-like viruses" in outbreaks and sporadic cases of gastroenteritis in Ireland. *J Med Virol.* 2001; 65(2):388-94.

Foley B, O'Mahony J, Morgan SM, Hill C, Morgan JG. Detection of sporadic cases of Norwalk-like virus (NLV) and astrovirus infection in a single Irish hospital from 1996 to 1998. *J Clin Virol.* 2000; 17(2):109-17.

Gaggero A, O'Ryan M, Noel J, Glass R, Monroe S, Mamani N, et al. Prevalence of astrovirus infection among Chilean children with acute gastroenteritis. *J Clin Microbiol* 1998; 36:3691-3.

Gallimore CI, Green J, Lewis D, Richards AF, Lopman BA, Hale AD, et al. Diversity of noroviruses cocirculating in the north of England from 1998 to 2001. *J Clin Microbiol* 2004; 42: 1396-401.

Glass RI, Noel J, Mitchell D, Herrmann JE, Blacklow NR, Pickering LK, et al. The changing epidemiology of astrovirus-associated gastroenteritis: a review. *Arch Virol Suppl* 1996; 12: 287-300.

Gonin P, Couillard M, d'Halewyn MA. Genetic diversity and molecular epidemiology of Norwalk-like viruses. *J Infect Dis.* 2000; 182(3):691-7.

Gray JJ, Jiang X, Morgan-Capner P, Desselberger U, Estes MK. Prevalence of antibodies to Norwalk virus in England: detection by enzyme-linked

- immunosorbent assay using baculovirus-expressed Norwalk virus capsid antigen. *J Clin Microbiol.* 1993; 31(4):1022-5.
- Green KY, Ando T, Balayan MS, Berke T, Clarke IN, Estes MK, et al. Taxonomy of the caliciviruses. *J Infect Dis* 2000; 181 (suppl 2):S322-30.
- Green KY, Kapikian AZ. Human Caliciviruses. In: Knipe DM, Howley PM, Griffin DE, Lamb RA, Martin MA, Roizman B, Straus SE, editors. *Fields virology.* 4th ed., vol 2. Philadelphia : Lippincott Williams & Wilkins, 2001:841-66.
- Green SM, Dingle KE, Lambden PR, Caul EO, Ashley CR, Clarke IN. Human enteric Caliciviridae: A new prevalence small round-structured virus group by RNA-dependent RNA polymerase and capsid diversity. *J Gen Virol* 1994; 75: 1883-8.
- Greenberg HB, Matsui SM. Astroviruses and caliciviruses: emerging enteric pathogens. *Infect Agents Dis* 1992; 1: 71-91.
- Greenberg HB, Valdesuso J, Yolken RH, Gangarosa E, Gary W, Wyatt RG, et al. Role of Norwalk virus in outbreaks of nonbacterial gastroenteritis. *J Infect Dis* 1979; 139: 564-68.
- Greening GE, Kieft C, Baker MG. Norwalk-like viruses (NLVs) a common cause of gastroenteritis outbreaks. *NZ Public Health Report* 1999; 6: 73-77.
- Greening GE, Mirams M, Berke T. Molecular epidemiology of 'Norwalk-like viruses' associated with gastroenteritis outbreaks in New Zealand. *J Med Virol* 2001; 64:58-66.
- Grohmann GS, Glass RI, Pereira HG, Monroe SS, Hightower AW, Bryan RT. Enteric viruses and diarrhea in HIV-infected patients. *N Engl J Med* 1993; 329: 14-20.

Guerrant RL, Hughes JM, Jima NL, Drane J. Diarrhea in developed and developing countries: magnitude, special settings and etiologies. Rev Infect Dis 1990; 12: S41-50.

Guix S, Caballero S, Villena C, Bartolome R, Latorre C, Rabella N, et al. Molecular epidemiology of astrovirus infection in Barcelona, Spain. J Clin Microbiol. 2002; 40(1):133-9.

Guntapong R, Hansman GS, Oka T, Ogawa S, Kageyama T, Pongsuwanna Y, et al. Norovirus and sapovirus infection in Thailand. Jpn J Infect Dis 2004; 57:276-8.

Guo M, Hayes J, Cho Ko, Parwani AV, Lucas LM, Saif LJ. Comparative pathogenesis of tissue culture adapted and wild type Cowden porcine enteric calicivirus (PEC) in gnotobiotic pigs and induction of diarrhea by intravenous inoculation of wild type PEC. J Virol 2001; 75: 9239-51.

Hansman GS, Doan LP, Kguyen TA, Okitsu S, Katayama K, Ogawa S, et al. Detection of norovirus and sapovirus infection among children with gastroenteritis in Ho Chi Minh City, Vietnam. Arch Virol 2004a; 149: 1673-88.

Hansman GS, Katayama K, Maneekarn N, Peerakome S, Khamrin P, Tonusin S, et al. Genetic diversity of norovirus and sapovirus in hospitalized infants with sporadic cases of acute gastroenteritis in Chiang Mai, Thailand. J Clin Microbiol 2004b; 42:1305-7.

Hazelton PR, Coombs KM, Ball TB, Klass L, Milley D, Plourde P. Duration of Calicivirus Shedding and Viral Load in Patients During a Long Term Care Hospital Outbreak. In abstracts of the 19th annual meeting of the American society fro Virology 2000; abstr.W14-4: 80.

- Herrmann JE, Blacklow NR, Perron-Henry DM, Clements E, Taylor DN, Echeverria P. Incidence of enteric adenoviruses among children in Thailand and the significance of these viruses in gastroenteritis. *J Clin Microbiol.* 1988; 26(9):1783-6.
- Herrmann JE, Nowak N, Rerron-Henry D, Hudson W, Cubitt W, et al. Diagnosis of astrovirus gastroenteritis by antigen detection with monoclonal antibodies. *J Infect Dis* 1990; 161: 226-9.
- Herrmann JE, Taylor DN, Echeverria P, Blacklow NR. Astroviruses as a cause of gastroenteritis in children. *N Engl J Med* 1991; 324:1757-60.
- Hirakata Y, Arisawa K, Nishio O, Nakagomi O. Multiprefectural spread of gastroenteritis outbreaks attributable to a single genogroup II norovirus strain from a tourist restaurant in Nagasaki, Japan. *J Clin Microbiol.* 2005; 43(3):1093-8.
- Honma S, Nakata S, Numata K, Kogawa K, Yamashita T, Oseto M, et al. Epidemiological study of prevalence of genogroup II human calicivirus (Mexico virus) infections in Japan and Southeast Asia as determined by enzyme-linked immunosorbent assays. *J Clin Microbiol* 1998; 36:2481-4.
- Hudson RW, Herrmann JE, Blacklow NR. Plaque quantitation and virus neutralization assays for human astroviruses. *Arch Virol.* 1989; 108:33-8.
- Iritani N, Seto Y, Kubo H, Murakami T, Haruki K, Ayata M, et al. Prevalence of Norwalk-like virus infections in cases of viral gastroenteritis among children in Osaka City, Japan. *J Clin Microbiol* 2003; 41:1756-9.
- Jakab F, Meleg E, Banyai K, Melegh B, Timar L, Peterfai J, et al. One-year survey of astrovirus infection in children with gastroenteritis in a large hospital in

- Hungary: occurrence and genetic analysis of astroviruses. *J Med Virol* 2004; 74:71-7.
- Jakab F, Walter JE, Berke T, Matson DO, Mitchell DK, Szucs G. Molecular characterization and sequence analysis of human astroviruses circulating in Hungary. *FEMS Immunol Med Microbiol*. 2003; 39(2):97-102.
- Jiang X, Graham DY, Wang N, Estes MK. Norwalk virus genome cloning and characterization. *Science* 1990; 250:1580-3.
- Jiang X, Huang PW, Zhong WM, Farkas T, Cubitt DW, Matson DO. Design and evaluation of a primer pair that detects both Norwalk-and Sapporo-like caliciviruses by RT-PCR. *J Virol Methods* 1999; 83: 145-54.
- Jiang X, Matson DO, Velazquez FR, Zhong W, Hu J, Ruiz-Palacios G, et al. Study of Norwalk-related viruses in Mexican children. *J Med Virol* 1995; 47: 306-16.
- Jiang X, Wang M, Graham DY, Estes MK. Expression, self-assembly, and antigenicity of the Norwalk virus capsid protein. *J Virol* 1992; 66: 6527-32.
- Jiraphongsa C, Bresee JS, Pongsuwanna Y, Kluabwang P, Poonawagul U, Arporntip P, et al. Epidemiology and burden of rotavirus diarrhea in Thailand; results of sentinel surveillance. *J Infect Dis* 2005; 192: S87-93.
- Jonassen TO, Monceyron C, Lee TW, Kurtz TW, Grinde B. Detection of all serotypes of human astrovirus by the polymerase chain reaction. *J Virol Methods* 1995; 52: 327-34.
- Kageyama T, Shinohara M, Uchida K, Fukushi S, Hoshino FB, Kojima S, et al. Coexistence of multiple genotypes, including newly identified genotypes, in outbreaks of gastroenteritis due to Norovirus in Japan. *J Clin Microbiol* 2004; 42:2988-95.

Kang YH, Park YK, Ahn JB, Yeun JD, Jee YM. Identification of human astrovirus infections from stool samples with diarrhea in Korea. Arch Virol 2002; 147:1821-7.

Kapikian AZ, Wyatt RG, Dolin R, Thornhill TS, Kalica AR, Chanock RM. Visualization by immune electron microscopy of a 27 nm particle associated with acute infectious nonbacterial gastroenteritis. J virol 1972; 10:1075-81.

Katayama K, Miyoshi T, Uchino K, Oka T, Tanaka T, Takeda N, et al. Novel recombinant sapovirus. Emerg Infect Dis. 2004; 10(10):1874-6.

Katayama K, Shirato-Horikoshi H, Kojima S, Kageyama T, Oka T, Hoshino FB, et al. Phylogenetic analysis of the complete genome of 18 Norwalk-like viruses. Virology 2002; 299: 225-39.

Khamrin P, Peerakome S, Wongsawasdi L, Tonusin S, Sornchai P, Maneerat V, et al. Emergence of human G9 rotavirus with an exceptionally high frequency in children admitted to hospital with diarrhea in Chiang Mai, Thailand. J Med Virol. 2006; 78(2):273-80.

Kidd AH, Cosgrove BP, Brown RA, Madeley CR. Faecal adenoviruses from Glasgow babies. Studies on culture and identity. J Hyg (Lond). 1982; 88(3):463-74.

Kirkwood CD, Bishop RF. Molecular detection of human calicivirus in young children hospitalized with acute gastroenteritis in Melbourne, Australia, during 1999. J Clin Microbiol 2001; 39: 2722-4.

Kirkwood CD, Clark R, Bogdanovic-Sakran N, Bishop RF. A 5-year study of the prevalence and genetic diversity of human caliciviruses associated with sporadic cases of acute gastroenteritis in young children admitted to hospital in Melbourne, Australia (1998–2002). J Med Virol 2005; 77: 96-101.

- Konno T, Suzuki H, Ishida N, Chiba R, Mochizuki K, Tsunoda A. Astrovirus-associated epidemic gastroenteritis in Japan. *J Med Virol.* 1982; 9(1):11-7.
- Koopmans M, Strien E, Vennema H. Molecular epidemiology of human caliciviruses. In: Desselberger U, Gray J, editors. *Viral gastroenteritis.* vol 9. Netherlands : ELSEVIER SCIENCE B.V., 2003:523-54.
- Koopmans M, Vinje J, de Wit M, Leenen I, van der Poel W, van Duynhoven Y. Molecular epidemiology of human enteric caliciviruses in the Netherlands. *J Infect Dis* 2000; 181 (suppl 2): S262-9.
- Koopmans M. Molecular epidemiology of human enteric caliciviruses in The Netherlands. In: *Gastroenteritis Viruses*, Chichester: Wiley, 2001: 197-218.
- Koopmans MP, Bijen MH, Monroe SS, Vinje J. Age-stratified seroprevalence of neutralizing antibodies to astrovirus types 1 to 7 in humans in The Netherlands. *Clin Diagn Lab Immunol.* 1998; 5(1):33-7.
- Kosek M, Bern C, Guerrant RL. The global burden of diarrhoeal disease, as estimated from studies published between 1992 and 2000. *Bulletin of the World Health Organization* 2003; 81:197-204.
- Kurtz JB, Lee TW, Craig JW, Reed SE. Astrovirus infection in volunteers. *J Med Virol* 1979; 3: 221-30.
- Kurtz JB, Lee TW. Astroviruses: Human and animal. *Ciba Found Symp* 1987; 128: 92-107.
- Kurtz JB, Lee TW. Human astrovirus serotypes. *Lancet* 1984; 2: 140.
- Lau CS, Wong DA, Tong LK, Lo JY, Ma AM, Cheng PK, et al. High rate and changing molecular epidemiology pattern of norovirus infections in sporadic

cases and outbreaks of gastroenteritis in Hong Kong. *J Med Virol* 2004; 73:113-7.

Lee TW, Kurtz JB. Prevalence of human astrovirus serotypes in the Oxford region 1976-92, with evidence for two new serotypes. *Epidemiol Infect* 1994; 112: 187-93.

Lee TW, Kutz JB. Human astrovirus serotypes. *J Hyg (Cambridge)* 1982; 89: 539-40.

Leksomboon U, Echeverria P, Suvongse C, Duangmani C. Viruses and bacteria in pediatric diarrhea in Thailand: a study of multiple antibiotic-resistant enteric pathogens. *Am J Trop Med Hyg* 1981; 30:1281-90.

Levy AG, Widerlite L, Schwartz CJ, Dolin R, Blacklow NR, Gardner JD, et al. Jejunal adenylate cyclase activity in human subjects during viral gastroenteritis. *Gastroenterology*. 1976; 70(3):321-5.

Lew JF, Moe CL, Monroe SS, Allen JR, Harrison BM, Forrester BD, et al. Astrovirus and adenovirus associated with diarrhea in children in day care settings. *J Infect Dis*. 1991; 164(4):673-8.

Lewis DC, Hale A, Jiang X, Eglin R, Brown DW. Epidemiology of Mexico virus, a small round-structured virus in Yorkshire, United Kingdom, between January 1992 and March 1995. *J Infect Dis*. 1997; 175(4):951-4.

Lewis DC, Lightfoot NF, Cubitt WD, Wilson SA. Outbreaks of astrovirus type I and rotavirus gastroenteritis in a geriatric in-patient population. *J Hosp Infect* 1989; 14: 9-14.

Lopman B, Vennema H, Kohli E, Pothier P, Sanchez A, Negredo A, et al. Increase in viral gastroenteritis outbreaks in Europe and epidemic spread of new norovirus variant. *Lancet* 2004; 363: 682-8.

Lopman BA, Adak GK, Reacher MH, Brown DW. Two epidemiologic patterns of norovirus outbreaks: surveillance in England and Wales, 1992-2000. *Emerg Infect Dis* 2003; 9:71-7.

Lopman BA, Brown DW, Koopmans M. Human caliciviruses in Europe. *J Clin Virol*. 2002; 24(3):137-60.

Lukashov VV, Goudsmit J. Evolutionary relationships among Astroviridae. *J Gen Virol*. 2002; 83(Pt 6):1397-405.

Madeley CR, Comparison of the features of astroviruses and caliciviruses seen in samples of feces by electron microscopy. *J Infect Dis* 1979; 139: 519-23.

Madeley CR, Cosgrove BP. 28 nm particles in faeces in infantile gastroenteritis. *Lancet* 1975; 2:451-2.

Maguire AJ, Green J, Brown DW, Desselberger U, Gray JJ. Molecular epidemiology of outbreaks of gastroenteritis associated with small round-structured viruses in East Anglia, United Kingdom, during the 1996-1997 season. *J Clin Microbiol* 1999; 37: 81-9.

Maldonado Y, Cantwell M, Old M, Hill D, Sanchez ML, Logan L, et al. Population-based prevalence of symptomatic and asymptomatic astrovirus infection in rural Mayan infants. *J Infect Dis*. 1998; 178(2):334-9.

Marie-Cardine A, Gourlaine K, Mouterde O, Castignolles N, Hellot MF, Mallet E, Buffet-Janvresse C. Epidemiology of acute viral gastroenteritis in children hospitalized in Rouen, France. *Clin Infect Dis*. 2002; 34(9):1170-8.

- Marshall JA, Hellard ME, Sinclair MI, Fairley CK, Cox BJ, Catton MG, et al. Incidence and characteristics of endemic Norwalk-like virus-associated gastroenteritis. *J Med Virol* 2003; 69: 568-78.
- Marshall JA, Yuen L, Catton MG, Wright PJ. Summer vomiting disease? *Med J Aust* 1999; 171: 686-87.
- Martines J, Phillips M, Feachem RG. Diarrheal disease. In: Jamison DT, Mosely WH, Measham AR, Bobadilla JL, editors. *Disease control priorities in developing countries*. Oxford University Press, 1993:91-116.
- Matsui M, Ushijima H, Hachiya M, Kakizawa J, Wen L, Oseto M, et al. Determination of serotypes of astroviruses by reverse transcription-polymerase chain reaction and homologies of the types by the sequencing of Japanese isolates. *Microbiol Immunol* 1998; 42: 539-47.
- Matsui SM, Greenberg HB. Astroviruses. In: Knipe DM, Howley PM, Griffin DE, Lamb RA, Martin MA, Roizman B, Straus SE, editors. *Fields virology*. 4th ed., vol 2. Philadelphia : Lippincott Williams & Wilkins, 2001:875-90.
- Matsui SM, Lewis TL, Chiu E, Smith LS, Dupuis K, Cahill CK, et al. An outbreak of astrovirus gastroenteritis in a nursing home and molecular characterization of the virus. *Gastroenterology* 1994; 106: A730.
- Mayo MA. A summary of taxonomic changes recently approved by ICTV. *Arch Virol* 2002; 147:1655-6.
- McIver CL, Palombo EA, Doultree JC, Mustafa H, Marshall JA, Rawlinson WD. Detection of astrovirus gastroenteritis in children. *J Virol Methods* 2000; 84: 99-105.

Meeroff JC, Schreiber DS, Trier JS, Blacklow NR. Abnormal gastric motor function in viral gastroenteritis. *Ann Intern Med.* 1980; 92(3):370-3.

Méndez-Toss M, Griffin DD, Calva J, Contreras JF, Puerto FI, Mota F, et al. Prevalence and genetic diversity of human astroviruses in Mexican children with symptomatic and asymptomatic infections. *J Clin Microbiol* 2004; 42:151-7.

Mitchell DK, Matson DO, Jiang X, Berke T, Monroe SS, Carter MJ, et al. Molecular epidemiology of childhood astrovirus infection in child care centers. *J Infect Dis* 1999; 180: 514-7.

Mitchell DK, Matson DO, Cubitt WD, Jackson LJ, Willcocks MM, Pickering LK, et al. Prevalence of antibodies to astrovirus types 1 and 3 in children and adolescents in Norfolk, Virginia. *Pediatr Infect Dis J.* 1999; 18:249-54.

Monroe SS, Glass RI, Noah N, Flewett TH, Caul EO, Ashton CI, et al. Electron microscopic reporting of gastrointestinal viruses in the United Kingdom, 1985-1987. *J Med Virol.* 1991; 33(3):193-8.

Moore P, Steele AD, Lecatsas G, Alexander JJ. Characterisation of gastro-enteritis-associated adenoviruses in South Africa. *S Afr Med J.* 1998; 88(12):1587-92.

Mount AW, Ando T, Koopmans M, Bresee J, Noel J, Glass RI. Cold weather seasonality of gastroenteritis associated with Norwalk-like viruses. *J Infect Dis* 2000; 181 (suppl 2): S284-7.

Murray CJL, Lopez AD, Mathers CD, Stein C. The global burden of disease 2000 project: aims, methods, and data sources. Geneva: World Health Organization 2001.

Mustafa H, Palombo E, Bishop R. Epidemiology of astrovirus Infection in young children hospitalized with acute gastroenteritis in Melbourne, Australia, over a period of four consecutive years, 1995 to 1998. *J Clin Microbiol* 2000; 38:1058-62.

Nadan S, Walter JE, Grabow WO, Mitchell DK, Taylor MB. Molecular characterization of astroviruses by reverse transcriptase PCR and sequence analysis: comparison of clinical and environmental isolates from South Africa. *Appl Environ Microbiol*. 2003; 69(2):747-53.

Naficy AB, Rao MR, Holmes JL, Abu-Elyazeed R, Savarino SJ, Wierzba TF, et al. Astrovirus diarrhea in Egyptian children. *J Infect Dis*. 2000; 182(3):685-90.

Nakata S, Chiba S, Terashima H, Nakao T. Prevalence of antibody to human calicivirus in Japan and Southeast Asia determined by radioimmunoassay. *J Clin Microbiol* 1985; 22: 519-21.

Nakata S, Honma S, Numata K, Kogawa K, Ukae S, Adachi N, et al. Prevalence of human calicivirus infections in Kenya as determined by enzyme immunoassays for three genogroups of the virus. *J Clin Microbiol* 1998; 36: 3160-3.

Nakata S, Honma S, Numata KK, Kogawa K, Ukae S, Morita Y, et al. Members of the family caliviridae (Norwalk virus and Sapporo virus) are the most prevalent cause of gastroenteritis outbreaks among infants in Japan. *J Infect Dis* 2000; 181: 2029-32.

Nakayama M, Ueda Y, Kawamoto H, Han-jun Y, Saito K, Nishio O, et al. Detection and sequencing of Norwalk-like viruses from stool samples in Japan using

reverse transcription-polymerase chain reaction amplification. *Microbiol Immunol* 1996; 40:317-20.

Noel JS, Ando T, Leite JP, Green KY, Dingle KE, Estes MK, et al. Correlation of patient immune responses with genetically characterized small round-structured viruses involved in outbreaks of nonbacterial acute gastroenteritis in The United States, 1990 to 1995. *J Med Virol* 1997; 53:372-83.

Noel JS, Fankhauser RL, Ando T, Monroe SS, Glass RI. Identification of a distinct common strain of (Norwalk-like viruses) having a global distribution. *J Infect Dis* 1999; 179: 1334-44.

Noel JS, Lee TW, Kurtz JB, Glass RI, Monroe SS. Typing of human astroviruses from clinical isolates by enzyme immunoassay and nucleotide sequencing. *J Clin Microbiol* 1995; 33: 797-801.

Numata K, Nakata S, Jiang X, Estes MK, Chiba S. Epidemiological study of Norwalk virus infections in Japan and Southeast Asia by enzyme-linked immunosorbent assays with Norwalk virus capsid protein produced by the baculovirus expression system. *J Clin Microbiol* 1994; 32:121-6.

Oh D and Schreier E. Molecular characterization of human astroviruses in Germany. *Arch virol* 2001; 146(3): 443-55.

Oh DY, Gaedicke G, Schreier E. Viral agents of acute gastroenteritis in German children: prevalence and molecular diversity. *J Med Virol* 2003; 71: 82-93.

Okada M, Ogawa T, Kaiho I, Shinozaki K. Genetic analysis of noroviruses in Chiba prefecture, Japan, between 1999 and 2004. *J Clin Micrlbiol* 2005; 43:4391-401.

- Okada M, Shinozaki K, Ogawa T, Kaiho I. Molecular epidemiology and phylogenetic analysis of Sapporo-like viruses. *Arch Virol* 2002; 147:1445-51.
- Okhuysen PC, Jiang X, Ye L, Johnson PC, Estes MK. Viral shedding and fecal IgA response after Norwalk virus infection. *J Infect Dis* 1995; 171: 566-9.
- O'Ryan ML, Mamani N, Gaggero A, Avendano LF, Prieto S, Pena A, et al. Human caliciviruses are a significant pathogen of acute sporadic diarrhea in children of Santiago, Chile. *J Infect Dis* 2000; 182: 1519-22.
- Oshiro LS, Haley CE, Roberto RR, Riggs JL, Croughan M, Greenberg H, et al. A 27-nm virus isolated during an outbreak of acute infectious nonbacterial gastroenteritis in a convalescent hospital: a possible new serotype. *J Infect Dis*. 1981; 143(6):791-5.
- Otsu R, Ishikawa A, Mukae K, Nakayama H, Sarashi M. Molecular epidemiology of Norwalk-like virus (NLV) outbreaks occurring in Kyushu Japan between 1988 and 1993. *Eur J Epidemiol* 2003; 18: 369-72.
- Palombo EA, Bishop RF. Annual incidence, serotype distribution, and genetic diversity of human astrovirus isolates from hospitalized children in Melbourne, Australia. *J Clin Microbiol* 1996; 34:1750-3.
- Pang XL, Honma S, Nakata S, Vesikari T. Human caliciviruses in acute gastroenteritis of young children in the community. *Pediatr Infect Dis J* 2000; 18:420-6.
- Pang XL, Joensuu J, Vesikari T. Human calicivirus-associated sporadic gastroenteritis in Finnish children less than two years of age followed prospectively during a rotavirus vaccine trial. *Paediatr Infect Dis J* 1999a; 18: 420-6.

Pang XL, Vesikari T. Human astrovirus-associated gastroenteritis in children under two years of age followed prospectively during a rotavirus vaccine trial. *Acta Paediatr* 1999b; 88: 532-6.

Parks CG, Moe CL, Rhodes D, Lima A, Barrett L, Tseng F, et al. Genomic diversity of Norwalk-like viruses (NLVs): Pediatric infections in a Brazilian shantytown. *J Med Virol* 1999; 58:426-34.

Phan TG, Okame M, Nguyen TA, Maneekarn N, Nishio O, Okitsu S, et al. Human astrovirus, norovirus (GI, GII), and sapovirus infections in Pakistani children with diarrhea. *J Med Virol* 2004; 73:256-61.

Phan TG, Okame M, Nguyen TA, Nishio O, Okitsu S, Ushijima H. Genetic diversity of sapovirus in fecal specimens from infants and children with acute gastroenteritis in Pakistan. *Arch Virol* 2005; 150: 371-7.

Phan TG, Trinh QD, Yagyu F, Sugita K, Okitsu S, Muller WEG, et al. Outbreak of sapovirus infection among infants and children with acute gastroenteritis in Osaka City, Japan during 2004-2005. *J Med Virol* 2006; 78: 839-46.

Phillips AD, Rice SJ, Walker-Smith JA. Astrovirus within human small intestinal mucosa. *Gut* 1982; 23: A923-4.

Prasad BVV, Hardy ME, Dokland T, Bella J, Rossmann MG, Estes MK. X-ray crystallographic structure of the Norwalk virus capsid. *Science* 1999; 286: 287-90.

Prasad BVV, Hardy ME, Estes MK. Structural studies of recombinant Norwalk capsids. *J Infect Dis* 2000; 181(suppl 2): S317-21.

Prasad BVV, Rothnagel R, Jing X, Estes MK. Three-dimensional structure of baculovirus-expressed Norwalk virus capsids. *J Virol* 1994; 68: 5117-25.

- Qiao H, Nilsson M, Abreu ER, Hedlund KO, Johansen K, Zaori G, et al. Viral diarrhea in children in Beijing, China. *J Med Virol* 1999; 57:390-6.
- Regli WJ, Green D, Jones N, Jarman J, Lewis G. First identification of Norwalk-like gastroenteritis in New Zealand by reverse transcription-PCR (RT-PCR). Presented at the NZ Microbiological Society Annual Conference, Dunedin 1995.
- Robinson S, Clarke IN, Vipond IB, Caul EO, Lambden PR. Epidemiology of human Sapporo-like caliciviruses in the south west of England: Molecular characterization of a genetically distinct isolate. *J Med Virol* 2002; 67: 282-8.
- Rohayem JS, Berger S, Juretzek T, Herchenroder O, Mogel M, Poppe M. A simple and rapid single-step multiplex RT-PCR to detect norovirus, astrovirus and adenovirus in clinical stool samples. *J Virol Methods* 2004; 118: 49-59.
- Roman E, Negredo A, Dalton RM, Wilhelmi I, Sanchez-Fauquier A. Molecular detection of human calicivirus among Spanish children with acute gastroenteritis. *J Clin Microbiol*. 2002; 40(10):3857-9.
- Saderi H, Roustai MH, Sabahi F, Sadeghizadeh M, Owlia P, De Jong JC. Incidence of enteric adenovirus gastroenteritis in Iranian children. *J Clin Virol*. 2002; 24(1-2):1-5.
- Sakai Y, Nakata S, Honma S, Tatsumi M, Numata-Kinoshita K, Chiba S. Clinical severity of Norwalk virus and Sapporo virus gastroenteritis in children in Hokkido, Japan. *Pediatr Infect Dis J* 2001; 20:849-53.
- Sakamoto T, Negishi H, Wang QH, Akihara S, Kim B, Nishimura S, et al. Molecular epidemiology of astroviruses in Japan from 1995 to 1998 by reverse

transcription-polymerase chain reaction with serotype-specific primers (1 to 8). *J Med Virol* 2000; 61:326-31.

Sakuma Y, chiba S, Kogasaka R, Terashima H, Nakamura S, Horino K, et al. Prevalence of antibody to human calicivirus in general population of northern Japan. *J Med Virol* 1981; 7: 221-5.

Schnagl RD, Barton N, Patrikis M, Tizzard J, Erlich J, Morey F. Prevalence and genomic variation of Norwalk-like viruses in central Australia in 1995-1997. *Acta Virol* 2000; 44:265-71.

Schnagl RD, Belfrage K, Farrington R, Hutchinson K, Lewis V, Erlich J, et al. Incidence of human astrovirus in central Australia (1995 to 1998) and comparison of deduced serotypes detected from 1981 to 1998. *J Clin Microbiol* 2002; 40:4114-20.

Schreiber DS, Blacklow NR, Trier JS. The small intestinal lesion induced by Hawaii agent acute infectious nonbacterial gastroenteritis. *J Infect Dis* 1974; 129: 705-8.

Schreier E, Doring F, Kunkel U. Molecular epidemiology of outbreaks of gastroenteritis associated with small round structured viruses in Germany in 1997/98. *Arch Virol*. 2000; 145(3):443-53.

Schuffenecker I, Ando T, Thouvenot D, Lina B, Aymard M. Genetic classification of "Sapporo-like viruses". *Arch Virol* 2001; 146:2115-32.

Sekine S, Okada S, Hayashi Y, Ando T, Terayama T, Yabuuchi K, et al. Prevalence of small round structured virus infections in acute gastroenteritis outbreaks in Tokyo. *Microbiol Immunol*. 1989 ;33(3):207-17.

- Sirinavin S, Techasaensiri C, Okascharoen C, Nuntnarumit P, Tonsuttakul S, Pongsawan Y. Neonatal astrovirus gastroenteritis during an inborn nursery outbreak. *J Hosp Infect.* 2006; 64(2):196-7.
- Smit TK, Bos P, Peenze I, Jiang X, Estes K, Steele AD. Seroepidemiological study of genogroup I and II calicivirus infections in South and Southern Africa. *J Med Virol* 1999; 59: 227-31.
- Soares CC, Volotao EM, Albuquerque MC, da Silva FM, de Carvalho TR, Nozawa CM, et al. Prevalence of enteric adenoviruses among children with diarrhea in four Brazilian cities. *J Clin Virol.* 2002; 23(3):171-7.
- Subekti DS, Lesmana M, Tjaniadi P, Safari N, Frazier E, Simanjuntak C, et al. Incidence of Norwalk-like viruses, rotavirus and adenovirus infection in patients with acute gastroenteritis in Jakarta, Indonesia. *FEMS Immuno and Med Microbiol* 2002a; 33: 27-33.
- Subekti DS, Tjaniadi P, Lesmana M, Simanjuntak C, Komalarini S, Dgidowirogo H, et al. Characterization of Norwalk-like virus associated with gastroenteritis in Indonesia. *J Med Virol* 2002b; 67:253-8.
- Suwatano O. Acute diarrhea in under five-year-old children admitted to King Mongkut Prachomklao hospital, Phetchaburi province. *J Med Assoc Thai* 1997; 80:26-32.
- Synder JD, Merson MH. The magnitude of the global problem of acute diarrheal disease: a review of active surveillance data. *Bull World Health Organ* 1982; 60:605-13.

- Taylor MB, Walter J, Berke T, Cubitt WD, Mitchell DK, Matson DO. Characterisation of a South African human astrovirus as type 8 by antigenic and genetic analyses. *J Med Virol.* 2001; 64(3):256-61.
- Tompkins DS, Hudson MJ, Smith HR, Eglin RP, Wheeler JG, Brett MM, et al. Study of infectious intestinal disease in England: microbiological findings in cases and controls. *Commun Dis Public Health* 1999; 2: 108-13.
- Utagawa ET, Nishizawa S, Sekine S, Hayashi Y, Ishihara Y, Oishi I, et al. Astrovirus as a cause of gastroenteritis in Japan. *J Clin Microbiol* 1994; 32: 1841-5.
- Vinje J, Deijl H, van der Heide R, Lewis D, Hedlund KO, Svensson L, et al. Molecular detection and epidemiology of Sapporo-like viruses. *J Clin Microbiol* 2000; 38: 530-6.
- Walter JE, Mitchell DK, Guerrero ML, Berk T, Matson DO, Monroe SS, et al. Molecular characterization of a novel recombinant strain of human astrovirus associated with gastroenteritis in children. *Arch Virol* 2001; 146: 2357-67.
- Walter JE, Mitchell DK. Astrovirus infection in children. *Curr Opin Infect Dis.* 2003; 16(3):247-53.
- Wang QH, Kakizawa J, Wen LY, Shimizu M, Nishio O, Fang ZY, et al. Genetic analysis of the capsid region of astroviruses. *J Med Virol* 2001; 64:245-55.
- Warren KS. Tropical medicine or tropical health: the Health Clark lectures, 1988. *Rev Infect Dis* 1990; 12: 142-56.
- Wasi C, Louisirirotchanakul S, Thakerngpol K, Satrasook S, Surakhala M, Varavithya W, et al. The epidemiological study on viral diarrhoea in Thailand. *J Med Assoc Thai.* 1984; 67(7):369-75.

- Wheeler JG, Sethi D, Cowden JM, Wall PG, Rodrigues LC, Tompkins DS, et al. Study of infectious intestinal disease in England: rates in the community, presenting to general practice, and reported to national surveillance. *Br Med J* 1999; 318: 1046-50.
- White PA, Hansman GS, Li A, Dable J, Isaacs M, Fersom M, et al. Norwalk-like virus 95/96-US strain is a major cause of gastroenteritis outbreaks in Australia. *J Med Virol* 2002; 68: 113-8.
- Widdowson MA, Cramer EH, Hadley L, Bresee JS, Beard RS, Bulens SN, et al. Outbreaks of acute gastroenteritis on cruise ships and on land: identification of a predominant circulating strain of norovirus--United States, 2002. *J Infect Dis* 2004; 190:27-36.
- Wilhelmi I, Roman E, Sanchez-Fauquier A. Viruses causing gastroenteritis. *Clin Microbiol Infect*. 2003; 9(4):247-62.
- Willcocks MM, Ashton N, Kurtz JB, Cubitt WD, Carter MJ. Cell culture adaptation of astrovirus involves a deletion. *J Virol* 1994; 68(9): 6057-8.
- Willcocks MM, Kurtz JB, Lee TW, Carter MJ. Prevalence of human astrovirus serotype 4: Capsid protein sequence and comparison with other strains. *Epidemiol Infect* 1995; 114: 385-91.
- Wolfaardt M, Taylor MB, Booyse HF, Engelbrecht L, Grabow WO, Jiang X. Incidence of human calicivirus and rotavirus infection in patients with gastroenteritis in South Africa. *J Med Virol* 1997; 51: 290-6.
- Wright PL, Gunesekere IC, Doultree JC, Marshall JA. Small round-structured (Norwalk-like) viruses and classical human caliciviruses in Southeastern Australia, 1980-1996. *J Med Virol* 1998; 55: 312-20.

- Yan H, Yagyu F, Okitsu S, Nishio O, Ushijima H. Detection of norovirus (GI, GII), sapovirus and astrovirus in fecal samples using reverse transcription single-round multiplex PCR. *J Virol Methods* 2003; 114:37-44.
- Zheng D, Ando T, Fankhauser RL, Beard RS, Glass RI, Monroe SS. Norovirus classification and proposed strain nomenclature. *Virology* 2006; 346:312-23.
- Zintz C, Bok K, Parada E, Barnes-Eley M, Berke T, Staat MA. Prevalence and genetic characterization of caliciviruses among children hospitalized for acute gastroenteritis in the United States. *Infect Genet Evol* 2005; 5: 281-90.

ลิขสิทธิ์มหาวิทยาลัยเชียงใหม่
Copyright[©] by Chiang Mai University
All rights reserved