

SEATO MEDICAL RESEARCH STUDY ON RESPIRATORY AND ENTERIC VIRUSES

Coordinator: Philip K. Russell, LTC MC, Chief, Virology Dept.

Principal Investigators: Lloyd C. Olson, MAJ MC
Chaninthorn Suvongse, M.D.
Rapin Snithbhan, M.D.
Kanda Varavej, M.D.
Suchinda Udomsakdi, M.D.
Phanu Sithisomwong, D.D.S.
Pricha Singharaj, M.D.

Associate Investigators: Pramote Viranuvatti¹, M.D.
Mukda Trysananon², M.D.
Udom Lexumboom³, M.D. Ph.D.

Assistant Investigator: Supatra Chulachambok, R.N.

General Information

With the opening of new laboratory facilities in the School of Public Health in June, 1967 and the acquisition of additional personnel, expansion of virological capabilities was initiated. This has entailed the development of culture and serological techniques for any of those human viruses potentially present in Southeast Asia.

Despite Bangkok's tropical locale, approximately 60% of all pediatric visits to hospital and Maternal and Child Health clinics are for complaints of diseases of the respiratory tract. In general, there are two epidemic peaks of such diseases. One occurs in May and June with the advent of the Southwest monsoon rains, and is predominately of the upper respiratory tract. The other peak occurs in December-January during the cool dry season, and during this period complaints of lower respiratory disease seem to be more common. The occurrence of outbreaks of laryngotracheobronchitis, bronchiolitis and pneumonitis specifically suggest that at least some of the respiratory pathogens present in temperate climates are also present in Thailand.

Studies in other countries located in tropical or sub-tropical climates with incompletely developed public sanitation facilities have demonstrated the high prevalence rates of enterovirus infections. While the vast majority are subclinical infections, certainly a certain number may be manifested as exanths, or syndromes of the gastrointestinal, respiratory or central nervous systems. Preliminary studies in Bangkok indicate that enteroviruses are similarly ubiquitous in the environment, so that human exposure by a large part of the population must be a daily event.

For those reasons it would appear that Thailand offers fertile ground for study of the epidemiology and pathogenesis of human infections by these agents.

- 1 Staff pediatrician, Vachira Hospital.
- 2 Chief, Preventive Medicine, Siriraj Hospital.
- 3 Staff physician, Children's Hospital.

Appropriate cell culture systems for the isolation and study of human viruses have been developed to insure a routine supply. These include primary monkey kidney, continuous human diploid fibroblast, and several continuous heteroploid cell lines. In addition, primary human amnion and human embryonic kidney cultures are utilized when needed or when available.

Prototype virus strains of echovirus 1-33, Coxsackievirus A1-24 and B1-6, poliovirus 1-3, adenovirus 1-31, parainfluenza 1-5, mumps, measles, respiratory syncytial virus, influenza A, A1, A2, B, B1, and C, herpes simplex virus and reovirus 1-3 have been obtained and working pools produced. These are used for confirming the specificity and titers of reference antisera used for virus identification.

Serological tests for all of the above agents have been developed and adapted to the microtiter system. In general the attempt was made to employ the test measuring antibody types of the most specific and practical nature. These include hemagglutination-inhibition test for rubella; complement fixation tests for adenoviruses, herpes simplex, respiratory syncytial virus, mycoplasma pneumoniae, bedsonia group, and lymphocytic choriomeningitis; colorimetric metabolic-inhibition neutralization tests for poliovirus 1-3, Coxsackie A9 and B1-6; and neutralization tests for parainfluenza 1-4, the influenza viruses, mumps, and the reoviruses. The neutralization tests for the myxoviruses are done in microtiter and endpoints are determined by testing for the presence of hemagglutination in the nutrient media as the means of detecting virus replication during the incubation period.

Currently, studies are being planned or are underway to determine which agents are present in Thailand, which are important causes of disease, and to begin to accumulate information as to important factors in epidemiology. That important differences exist between the virological flora in Thailand as compared to temperate regions has already been exemplified by the unexpected finding of cytomegalovirus in 19% of nasopharyngeal swabs obtained from children with upper respiratory tract infections. The significance of this is as yet unknown pending further investigation, particularly as regards the question of morbid congenital infection.