Burden of Rotavirus Among Children Less Than 5 years in Kerala

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•BACKGROUND

•Rotavirus is the leading cause of childhood diarrheal disease morbidity and mortality. An estimated --- deaths occur each year among children <5 years of age.

•Previous studies in the Asian Rotavirus Surveillance Network and other regional networks have confirmed that rotavirus accounts for ~50% of childhood diarrheal hospitalizations.

•There is no specific treatment for rotavirus and adequate oral or intravenous rehydration is required to ensure recovery of patients. Orally-administered vaccines for rotavirus are now available.

•RATIONALE

•Well-established clinical, epidemiologic and laboratory methods for rotavirus surveillance are applicable in India.

• Disease burden data for rotavirus are needed across India to support evidenced-based decisions regarding use of vaccines

•OBJECTIVES

•To initiate the first systematic study of rotavirus gastroenteritis among children in Kerala State, India.

•To estimate the proportion of diarrhea due to rotavirus among children ≤ 5 years of age.

•To describe presently circulating rotavirus genotypes.

•METHODS

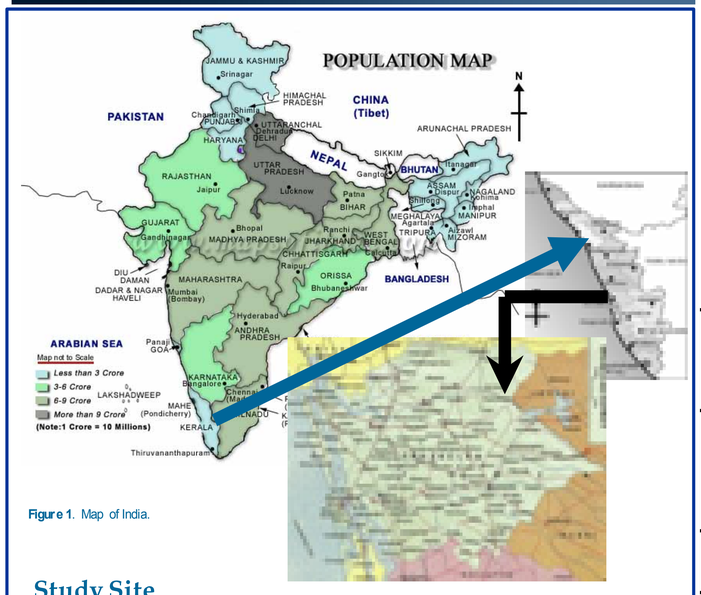


Figure 1. Map of India.

Study Site

Ernakulam district is composed of 7 taluks; this study was conducted in Kunnathunadu Thaluk composed of 23 villages. In 2001 national census, Kunnathunadu had 47,743 children ≤ 5 years of age.

Clinical

Hospitalised children ≤ 5 years of age admitted with acute watery diarrhea were eligible for enrollment. Children were examined and parents were interviewed by trained medical staff.

Epidemiology

A standardised case report form was used to collect demographic, clinical and health outcome data.

Stool collection and ELISA testing

Stool specimens were collected from hospitalised patients and stored at -20 °C prior to ELISA testing (RotaClone®, Meridian Diagnostics, Cincinnati, OH).

RT-PCR testing

Rotavirus-positive samples were tested by reverse transcription-polymerase chain reaction for G and P typing (CMC, Vellore).

Data management and analysis

All data were entered into an MS FoxPro surveillance data management system prior to analysis.

•RESULTS

Table 1. Diarrheal Patients ≤ 5 Years of Age by Health Facility and Location, February 1, 2009 – January 31, 2011 (N = 1807).

Health Facility in Surveillance Area	Public or Private	Location	Total Cases Enrolled (February 1, 2009 through Jan, 2011)
M.O.S.C. Medical College	Private	Kolenchery	571
Thaluk Hospital	Public	Muvattupuzha	39
Vallakkalil Hospital	Private	Muvattupuzha	32
Nirmala Hospital	Private	Muvattupuzha	216
Samaritan Hospital	Private	Pazhanganad	219
Sanjoe Hospital	Private	Perumbavoor	324
Thaluk Hospital	Public	Perumbavoor	116
Vatheyyath Hospital	Private	Perumbavoor	290
Total			1807

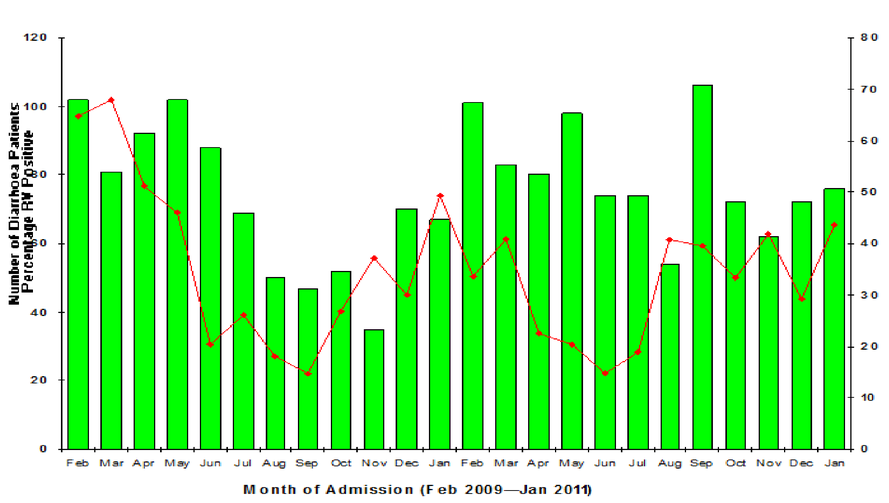
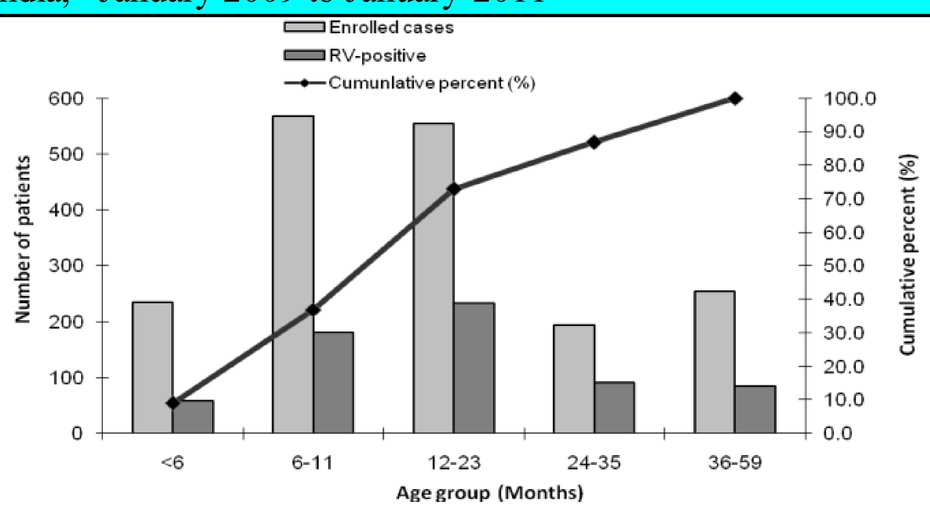


Table 2: Rotavirus results of Children with Diarrhea , Kerala, India, January 2009 to January 2011

Age Group (Months)	RV Positive (n=648)	RV Negative (n=1159)	Total (n=1807)
< 6 months	58(24.7%)	177(75.3%)	235(100%)
6 to 11	181(31.9%)	387(68.1%)	568(100%)
12 to 23	233(41.9%)	322 (58.0%)	555(100%)
24 to 35	91(46.9%)	103(53.1%)	194 (100%)
36 to 59	85 (33.3%)	170(66.7%)	255(100%)

FIG 1. Age distribution of children with diarrhea, Kerala, India, January 2009 to January 2011



•Participating hospitals include both private (n = 6) and public (n = 2) facilities.

•A total of 1807 children with diarrhea were admitted and had a stool specimen collected for rotavirus testing from February 1, 2009 – January 31, 2011.

•Of the 1807 stool specimens tested, a total of 648(35.8%) were positive for rotavirus by the RotaClone® ELISA test.

• Rotavirus infections were most common during the hot dry months from January through May.

• Rotavirus was less common during the wetter , monsoon season months of June through September.

• Overall, rotavirus causes an estimated 35.8% of diarrhea among children less than 5 years of age in this study site.

•The majority (78.4%) of rotavirus infections occurred among children aged 6 to 23 months.

Table 3. Distribution of G and P types among a randomly selected subset (n = 450) of rotavirus positive samples.

Genotype	Number
G1 P[8]	224(49.7%)
G9 P[8]	119 (26.4%)
G2P[4]	25(5.5%)
G9P[4]	12(2.6%)
G12 P[6]	6(1.3%)
G1P[6]	4(0.8%)
G12 P[8]	4(0.8%)
G1 P[4]	1 (0.2%)
G1 P[Untypable]	2(0.4%)
G9 P[Untypable]	11(2.4%)
Partially typed	6(1.3%)
Mixed infections	24(5.3%)
Both G and P untypable	12(2.6%))

• 50% of rotavirus strains typed in this subset were G1P[8] strains.

• An additional 26% were G9P[8] strains that have become increasing common in the past 10 years.

• 18% of strains were untypable suggesting the potential emergence of new rotavirus strains in India.

•DISCUSSION

• This study highlights that there is high prevalence of rotavirus diarrhea in Ernakulam, Kerala State and that it accounts for a large proportion of diarrheal disease in hospitalized children less than 5 years.

• Based on our findings, it is reasonable to expect rotavirus vaccination to have a major impact in reducing the burden in this region.

• Automated (handheld PDA) methods for surveillance data collection are now under evaluation in this site.

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Cardiovascular Involvement in Kawasaki Disease Among Children from Ernakulam District, Kerala

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•BACKGROUND

•Kawasaki disease [KD] is "A febrile, occulo-oro-cutaneo-acro-desquamatous syndrome with or without acute nonsuppurative cervical lympadentitis".

•20-30% of untreated patients can develop Coronary Artery Lesions [CAL]

•Long term complication of aneurysm/scarring of coronary artery is accelerated atherosclerosis and MI later in adult life.

•RATIONALE

•There is lack of knowledge about epidemology of KD in our country, similar information from Kerala is not available.

KD	Japan	U.S.A	India*	Kerala
Prevalence	1 in 185	?	?	?
Incidence	175/100,000	20– 25 /100,000	?	?

•OBJECTIVES

•To evaluate the clinical features at presentation and pattern of cardiovascular involvemnt among children from Ernakulam district, Kerala admitted with Kawasaki Disease .

•To identify markers that are associated with the development of coronary artery lesions.

•METHODS

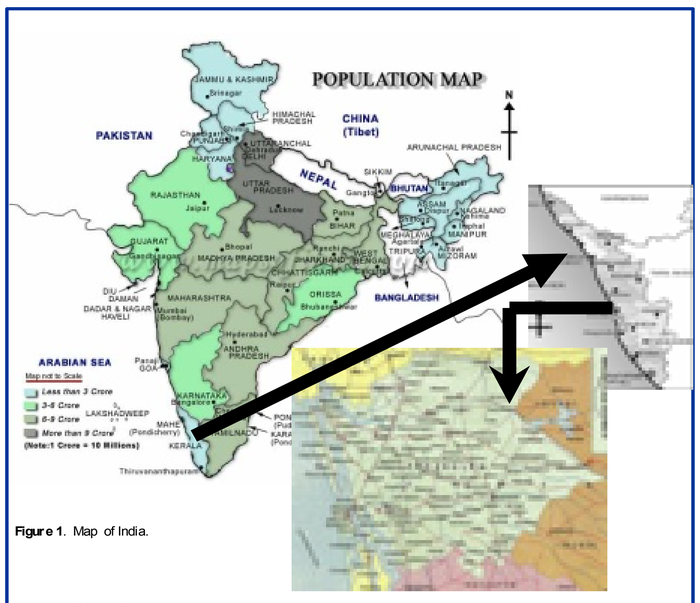


Figure 1. Map of India.

Study site:-

•This is a prospective study of 38 children admitted and treated at MOSC medical College Hospital, a tertiary level referral center in Ernakulam district

Inclusion Criteria:-

•All patients who met the criteria for KD according to Americal Heart Association were included in the study. Patients with coronary artery involvement but less than for criteria were labeled as incomplete KD.
•Complete blood count , ESR, CRP and routine urine examination was done in all patients. Children were evaluated by 2D Echo by an experienced cardiologist during acute phase , convalescent phase and at 6-8 weeks

Exclusion criteria:-

•Other febrile illnesses which resembled KD were excluded.

Ethics , consent & Statistics

•Study has approved by ethics committee and consent taken .Appropriate statistical method were used

RESULTS :

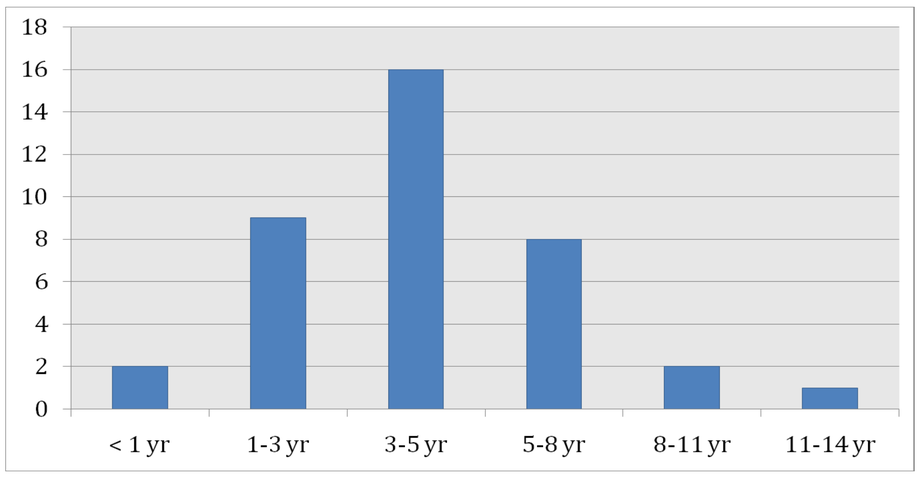


Figure 1: Age Specific Data

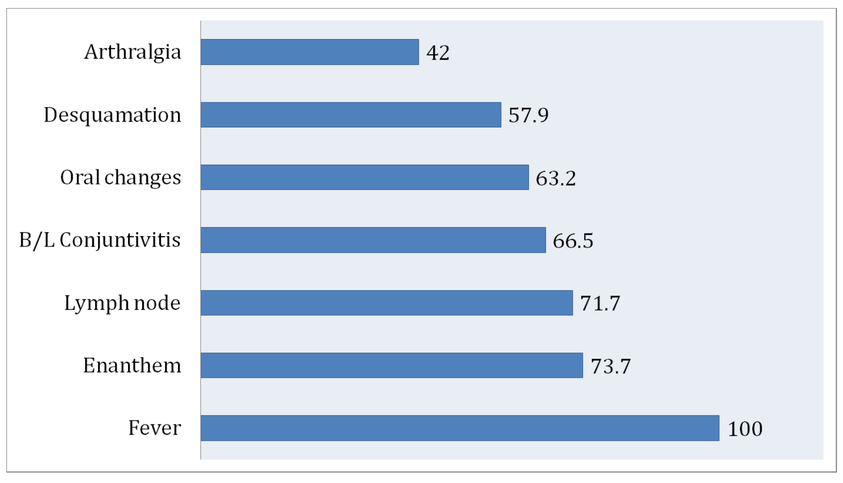


Figure 2: Clinical Features

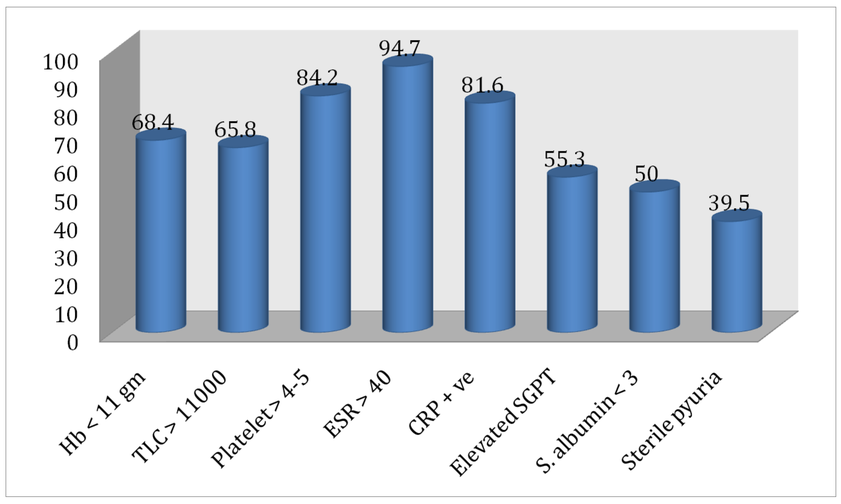


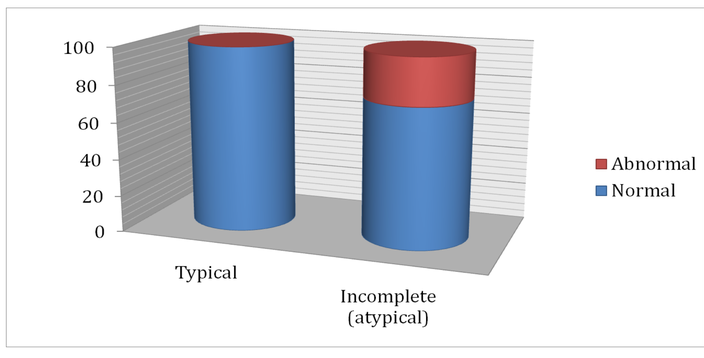
Figure 3: Laboratory Findings

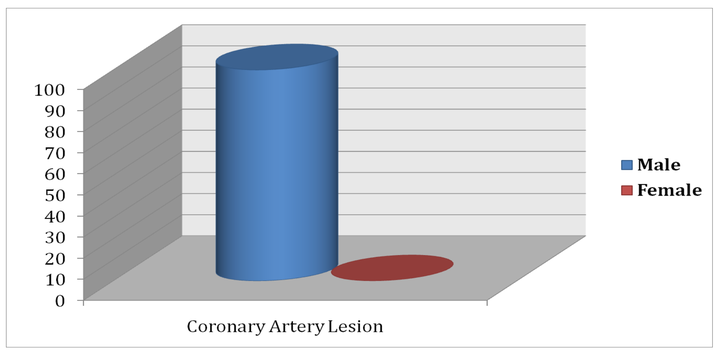
ECHO Abnormalities			
Age/ Sex	4Yyr/ M	21/2 Yr/M	8 Yr/ M
Presentation	Incomplete KD	Incomplete KD	Atypical KD
Coronaries	Dilated	Dilated	Dilated
Detected at	9 days	13 days	12 days
Follow up	6 wk Normal	3 months normal	3 months partial regression

Table 1: Clinical Outcome :Echo abnormalities

•A total of 38 children were diagnosed to have KD
•Majority(80%) of cases were <5 yrs of age and rapid decline was noted after 10 yrs.
•Girls out numbered boys, with overall male to female ratio of 0.8 to 1.
•Fever of more than 5 days duration was present in 100% children.
•Polymorphous exanthem was the commonest finding and arthralgia the least.
•ESR was high in all cases. Platelet count was significantly raised in 84% cases and CRP in 82% of cases.
•Of the 38 patients, 26 (68%) met full diagnostic criteria of KD and 32% had atypical KD.
•Atypical KD was seen only in boys.
•IVIg and aspiring was administered to all cases. 90% received IVIg within 10 days of illness.

Figure 4& 5 : Clinical outcome : Coronary Artery Lesions





• Echo was done in all patients and 3 (7.9%) among these had coronary artery abnormalities.

•Coronary artery dilatation was seen only in atypical KD and left coronary artery was involved in all cases.

• No mortality , recurrence & familial involvement were seen in the study population

•CONCLUSIONS

• A low rate of coronary artery involvement.

• Risk factors for CAL
- ➢Incomplete/atypical KD
- ➢Delay in starting IVIG
- ➢Male gender

•Early recognition & prompt treatment

RECOMMENDATIONS

•Adequately powered, multi centre, collaborative studies

•Better understanding of genetic influences, regional variations, diagnostic tests and best management practices.

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