

# Rapid test for adenovirus 40/41

After rotavirus, infection by adenovirus represents the second most common cause of viral enteritis, with an incidence varying between 4 and 12%. Although humans of all ages can be infected by adenovirus, children between the ages of 12 - 19 months are most at risk. After an incubation period of 8 to 10 days, periodic diarrhoea occurs, lasting for 4 to 5 days. This period is frequently characterised by light fever and vomiting. Ninety seven per cent of all patients present symptoms of liquid diarrhoea. The resulting dehydration can be life-threatening, particularly for infants (WHO data indicate that between 700 000 and 1 million deaths occur per year from viral enteritis, principally in the Third World). Viruses can be detected in the excreta for a period of 10 to 14 days (typically starting from 2 days before the enteritis and lasting till 5 days after).

## Structure

Adenoviruses are non-enveloped DNA viruses of about 80 nm in diameter. The structure is well-established. The viral capsid is formed from 252 capsomeres arranged in an icosahedron with 20 triangular faces and 12 vertices. There are 720 Hexon polypeptides II, 60 penton base polypeptides type III and 60 trimeric polypeptide IV fibre proteins. These latter

Disease	Predominant serotypes
Infantile gastroenteritis	40, 41
Upper respiratory tract infections	3, 7, 11 and others
Lower respiratory tract infections	3, 4, 7, 21
Pharyngoconjunctival fever	3, 4, 7
Epidemic keratoconjunctivitis	8, 19, 37
Acute haemorrhagic conjunctivitis	11
Acute haemorrhagic cystitis	7, 11, 21, 35
Genital ulcers ; urethritis	2, 19, 37
Gastroenteritis and pneumonia in Immunocompromised patients	Many serotypes

Table 1. Adenovirus serotypes and disease.

project from each of the 12 vertices of the icosahedron, giving the virus something of the appearance of an orbiting satellite. The Hexons contain group-specific antigenic determinants and type-specific neutralising epitopes.

## Serology

Forty-Seven group serotypes of human adenovirus have been identified to date; these serotypes are distinguishable using cross-neutralisation tests. Different syndromes are associated with particular serotypes (Table 1). Serotypes 40 and 41 are particularly associ-

ated with infantile gastroenteritis, underlying the importance of being able to unambiguously rule out or rule in these serotypes. Only if serotypes 40 or 41 are detected can a definitive diagnosis of adenovirus gastroenteritis, be made.

## Detection of adenovirus

Several techniques exist for the detection of adenovirus.

ELISA	40/41 Adeno-Strip	
	Positive	Negative
Positive	9	0
Negative	1	143

Table 2. Correlation of ELISA and Adenovirus 40/41 rapid test in a study using 153 faecal samples from patients with enteritis.

Specificity of 100% can be obtained by electron microscopy which of course suffers from the disadvantage of requiring a significant infrastructure as well as considerable expertise on the part of the technicians in the interpretation of viral observations. Variability in sampling can make this application of electron microscopy less sensitive.

ELISA techniques are most sensitive and, being based on specific immunological reagents have also a high specificity. ELISA methods however can only realistically be carried out in properly equipped laboratories.

## 40/41 AdenoStrip

The rapid one-step immunochromatographic test kit "40/41 AdenoStrip" uses immunoreagents specific for the hexon-antigens of adenovirus. In particular the test system uses monoclonal antibodies which are specific for the specific antigens of adenovirus 40/41. The test is easy to carry out and merely requires dilution of the faecal sample; the test strips are then incubated in 500 µl of this solution for 5 min at RT. Positive samples are indicated by readily visible bands (one test and one control band).

## Conclusion

The Adenovirus 40/41 rapid test has a high correlation with ELISA, but has the advantage of being much simpler to carry out.

## Coris BioConcept

Gembloux, Belgium, Fax + 32 81 719919  
www.corisbio.com

ENTER CLI 4903 Medica Hall 01/F33