Adenovirus is a frequent cause of infectious conjunctivitis. Human Adenoviruses are classified into 6 subgenera and 53 serotypes. Approximately one third of the human Adenovirus serotypes have been associated with common forms of Adenovirus related eye infections but the most common causes of acute conjunctivitis are related to serotypes 3, 4, 8, 11, 19 and 37. The serotypes have the following associations: serotypes 8, 1, 36 and 37 are most responsible for epidemic keratoconjunctivitis; 3, 4, 5 and 7 tend to cause pharyngoconjunctival fever, which usually affects children; serotypes 1-11 and 19 are the primary cause of nonspecific follicular conjunctivitis. However, the other serotypes can also produce clinically indistinguishable episodes of acute follicular conjunctivitis.

Cell culture in combination with immunofluorescence is the historical “gold standard” for identifying Adenovirus in conjunctival specimens. Virus isolation requires an intensive process, technical expertise and may take up to 3 weeks to complete. The polymerase chain reaction (PCR) is increasingly used in place of cell culture to detect Adenovirus. In addition, the differential diagnosis of various forms of conjunctivitis (viral, bacterial, allergic) is often difficult because they manifest similar symptoms.

PRINCIPLES OF THE PROCEDURE

AdenoPlus utilizes Direct Sampling Microfiltration technology. Adenoviral antigen, the conserved Adenovirus hexon protein, when present in the patient sample is captured between two antigen specific monoclonal antibodies. One antibody is immobilized in the detection zone of the device. The second antibody is labeled with colloidal gold. The detector line (A) is the unreacted control line (B) then the test runs requiring 10 minutes for a result.

NEGATIVE RESULTS

The presence of both a BLUE line in the control zone and a RED line in the result zone indicates a positive result. An uneven or incomplete RED line is due to an uneven distribution of eye fluid on the sampling fleece (C). Even if the RED line is faint in color, it must be interpreted as positive. A negative result indicates the absence of Adenovirus antigens in the tear fluid.

Influenza A

AdenoPlus has built-in procedural controls (see below). For daily quality control, RPS recommends documenting that these internal and external quality controls be checked for the first sample tested each day.

The unused device also has faint orange lines in the result window (H). If a streaky-fluid wave in the ocular fluid is present, the test may be affected. The sample may be repeated 30 minutes later.

If the test runs and the runs and the results work, a blue line will appear in the control zone. This is indicative of the functionality of the test.

The appearance of the control line indicates the correct application and performance of the test. The control line must appear in all valid tests. If the control line does not appear, the test must be interpreted as invalid and has to be repeated by resampling the eye using a new AdenoPlus test kit.

A purple fluid wave is observed moving across the result window (H) while the test is running. Once there is a purple fluid wave in the result window (H) and 10 minutes have elapsed, the test may be accurately read. If there is a streaky-fluid wave in the background in 10 minutes, then an additional 5-10 minutes of running time prior to interpretation. The clearing of the background color from the result window (H) is a negative background-control.
The prevalence of Adenovirus varies during the year and from region to region, with outbreaks typically occurring during spring and early summer. The true incidence of Adenoviral conjunctivitis is dependent on many factors including the method of specimen collection and the patient selection used. In one study, the prevalence of Adenovirus infections varied between 20% and 75% of all cases of infectious conjunctivitis. In the AdenoPlus clinical study, the Adenoviral incidence was found to be 24%.

**INTERFERING SUBSTANCES**

A prospective, multicenter, masked, clinical trial was performed at a combination of private ophthalmology practices and academic centers. The study enrolled 128 patients presenting with a clinical diagnosis of acute viral conjunctivitis. Always test the hexon protein as it is detected by the AdenoPlus test with the expected result when tested by untrained users. The prospective clinical study described in the Performance Section above was conducted with 26 intended users at 3 CLIA-waived sites. The study enrolled 128 patients presenting with a clinical diagnosis of acute viral conjunctivitis. The following agreement was observed between AdenoPlus and viral cell culture.

Sensitivity: 90% (28/31) 95% CI [74.2-98.0]

Specificity: 96% (97/102) 95% CI [92.2-99.1]

**CLAVER PERFORMANCE**

The studies were conducted to evaluate the accuracy of AdenoPlus when used by operators with weak reactive results for “Weak Negative” samples are “Positive,” while the expected results when tested by untrained users is “Negative.” There were no invalid results.

**REFERENCE**