Comparison of Immunochromatography with ELISA to detect Adenovirus in stool specimens


*Coris BioConcept, 199, rue Marcel Lecomte, B-5100 Namur (Wépion), BELGIUM, **Institut d’Hygiène et de Bactériologie, 55, Bd Saintelette, B-7000 Mons, BELGIUM, ***Hopital Universitaire Saint-Pierre, 299, Rue Haute, B-1000 BRUXELLES, BELGIUM

Introduction

Adenovirus strains are known to be diffuse agents of acute gastroenteritis.
Several methods are used to identify this agent. Amongst them are latex agglutination test (LAT) and enzyme-linked immunosorbent assay (ELISA). These techniques if sensitive and specific are either time consuming or need some skills for the specification.
Purpose of the present study was to develop a test aimed to be sensitive, specific and friendly to use.

For several years, immunochromatography is a new technique developed to allow quick determination of several pathogens in serum as well as in stool specimens.

Material and Methods

ELISA Adenoclone

Stool specimens were obtained from patients suffering of enteritis.
Samples were already tested for bacterial and viral pathogen.
Premier Adenoclone ELISA protocol was followed according to insert recommendations. Samples were diluted in 1 ml of sample diluent.
Conjugates and diluted samples are incubated together for 60 minutes at room temperature.
Wells are washed 5 to 6 times with deionized water and then incubated with substrate and TMB for 10 minutes before readings at 450 nm.
Sample with an absorbance greater than 0.150 should be regarded as positive.

Adeno grp-Strip

Stool samples were diluted from 5 to 10 % in the provided dilution buffer according to the protocol defined during the test development.
After a couple of minutes to allow the pellet to settle down, the stick is immersed in the liquid phase and the chromatography starts up. Top of the stick is reached within 5 minutes.
Sample is regarded as positive if two pink lines appear on the stick after a 5 minutes incubation. It is regarded as negative if one line appears at the top of the stick.

Results

- Total samples tested: 432
- Positive samples with ELISA: 29
- Positive samples with Adeno grp-Strip: 27
- Negative samples with ELISA: 403
- Negative samples with Adeno grp-Strip: 405
- Specificity is defined as follows: N/(N+FP) with N=negatives FP=false positives
- Sensitivity is defined as follows: P/(P+FN) with P=positives FN=false negatives
- Negative predictive value is defined as follows: N/(N+FN)
- Positive predictive value is defined as follows: P/(P+FP)

- Specificity: 99.7 %
- Negative Predictive value: 99.5 %
- Sensitivity: 93.1 %
- Positive Predictive value: 96.4 %

Conclusions

- The Adeno grp-Strip is very specific.
- The Adeno grp-Strip is very sensitive.
- Dried used strips could be archived.
- The test is simple to use and does not require any special skill to be interpreted.
- Time needed to perform 432 samples, including dilution was 4.5 hours i.e. half the time needed for the ELISA.

Snapshot protocol

1. Put 0.5 ml of dilution buffer in test tube
2. Insert samples stick with fecal material sample
3. Shake gently to homogenize and wait for 1 or 2 min.
4. Discard sampling stick and incubate Adeno-Strip into the test tube for at least 3 minutes
5. Read results immediate 2 lines =positive result
1 line=negative result

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