

Prevalence of Rotavirus Infections in Calves with Diarrhea in Konya Region

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Abstract: In this study, it was aimed to investigate frequency of rotavirus infections in calves in Konya region by feces and blood sampling 106 diarrheic calves of 0-6 months old. Feces samples were examine for rotavirus antigen and blood samples were tested for specific antibodies by Enzyme Linked Immunosorbent Assay (ELISA) and whether how common rotavirus infections. Of the 106 feces samples examined by ELISA 9 samples (8.50%) were identified as positive and blood samples checked by ELISA revealed 90 samples (84.90%) developed antibodies to rotavirus. The proportion of positivity in feces and blood samples suggested that rotavirus infections are common in the region.

Key words: Rotavirus, calves, diarrhea, antigen, antibody, ELISA

INTRODUCTION

Newborn calves with acute gastroenteritis are located in large and small tie-stall barns. Rotaviruses are important in mortality and morbidity for newborn calves with acute gastroenteritis (Garcia-Sanchez *et al.*, 1993).

Many infectious or non-infectious agents play role in newborn calves with diarrhea. There are many infectious agents that e.g., rotavirus, coronavirus, astrovirus, calicivirus responsible for newborn calves with diarrhea in tie-stall barns (Garcia-Sanchez *et al.*, 1993). Mainly rotaviruses lead to loss in many species of newborn, human including too (Goto *et al.*, 1986).

Rotavirus infections constitute the basic causes of economic loss owing to growth delay, birth of weak calves and high mortality levels in herds. Many studies have been showed 50% of newborn deaths due to diarrhea in calves (Garcia-Sanchez *et al.*, 1993).

The presence of rotavirus infection in many countries-including Turkey-has been put forward with virological and serological methods (Garcia-Sanchez *et al.*, 1993; Ekik, 2002; Burgu *et al.*, 1995; Yavru *et al.*, 2008). This study was performed to determine prevalence of rotavirus infections in calves with diarrhea in Konya region.

MATERIALS AND METHODS

Feces and sera samples: In this study, 20 large and 40 small, which were all tie-stall barns found in 1180

animals has been screened. About 106 feces and sera samples were examined from taken calves with diarrhea. All calves were taken colostrums and between 0-6 months. Samples were collected during the first days of the disease. Feces samples were stored at -20°C. Also, sera samples were stored at -20°C after sterility controls.

ELISA: Bio-X Diagnostics (Belgium) commercial ELISA kits were used for determination of the presence of rotavirus antigen in feces samples and for determination of the presence of rotavirus antibody in sera samples. Applications were made according to test procedures. Results were read at 450 nm wavelength.

RESULTS

Nine (8.50%) of 106 feces samples were found positive and 90 (84.90%) of 106 sera samples were found positive in this study.

Sera and feces samples were taken and regions and ELISA results were shown in Table 1. Distribution of diarrhea calves applied ELISA according to ages was shown in Table 2. Distributions of antigen positive samples with ELISA according to ages were shown in Table 3.

Table 1: Serum and feces samples were taken and regions and ELISA results

| Regions | Numbers | Sera+ | Sera- | Feces+ | Feces- |
|--------------|---------|-------|-------|--------|--------|
| Konya/Merkez | 86 | 73 | 13 | 6 | 80 |
| Aksehir | 14 | 12 | 2 | 2 | 12 |
| Sarayönu | 6 | 5 | 1 | 1 | 5 |
| Total | 106 | 90 | 16 | 9 | 97 |

Table 2: Distribution of diarrhea calves applied ELISA according to age

| Age (days) | Samples | % | Feces+ | Sera+ |
|------------|---------|--------|--------|-------|
| 0-15 | 30 | 28.30 | 9 | 14 |
| 15-30 | 25 | 23.58 | 0 | 25 |
| 30-45 | 21 | 19.81 | 0 | 21 |
| 45-60 | 13 | 12.26 | 0 | 13 |
| 60-120 | 10 | 9.43 | 0 | 10 |
| 120-180 | 7 | 6.60 | 0 | 7 |
| Total | 106 | 100.00 | 9 | 90 |

Table 3: Distribution of antigen positive examples with ELISA according to age

| Age (days) | No. of calves with diarrhea (0-15 days) | Positive | Positive (%) |
|------------|---|----------|--------------|
| 0-5 | 12 | 4 | 33 |
| 5-10 | 8 | 3 | 37 |
| 10-15 | 10 | 2 | 20 |

DISCUSSION

Rotavirus is one of the most important acute gastroenteritis reasons in newborn calves (Garcia-Sanchez *et al.*, 1993).

In Turkey, most of the researches on adult cattle have been realized by virological or serological. However, in recent years, some research has been in relation to the events of newborn enteritis in calves with diarrhea and healthy (Yazici, 1992; Alkan *et al.*, 1992; Ekik, 2002; Erdogan *et al.*, 2003).

Many methods are used for determination the presence of rotavirus antibodies. Serum Neutralisation (SN), Hemagglutination Inhibisyon (HAI), ELISA, Complement Fixation (CF) and Immunofluorescent (IF) tests are most widely used (Castrucci *et al.*, 1994; Ekik, 2002).

Many researchers investigated about the level of antibodies against to rotavirus (Schlafer and Scott, 1979; Burgu and Akca, 1983; Yazici, 1992; Castrucci *et al.*, 1994; Burgu *et al.*, 1995; Ekik, 2002; Yavru *et al.*, 2008). Seroprevalence of rotavirus infection was found between 22.86 and 100% in most of these studies.

Seropositivity rate (84.90%) in this research was found close to results obtained of other countries. But, except for th study of Ekik (2002), obtained the results of this study were higher than the results obtained in other studies in Turkey. A high rate of seropositivity can explain in the study that reason why sampling were made between 0-6 months old calves and they were fed with colostrum. We can explain that identified as seropositive calves at the same time showing symptoms of acute diarrhea, calves has been caught new infection or infection has long passed. Seropositive calves at the same time showing symptoms of acute diarrhea can explain either calves has been caught to infection new or a long-term course of infection is maintain. Both the findings and Ekik (2002) results showed that rotavirus infection was found to be very common in Konya.

Fecal contamination is the most important route in transmission of rotavirus. Virus spread too much with feces. Both healthy animals and calves with diarrhea spread too much spread rotavirus antigen (Schlafer and Scott, 1979). Many methods are used in determining the presence of rotavirus antigen. ELISA, Polyacrylamid Gel Electrophoresis (PAGE), Latex Agglutination (LA), Electron Microscopy (EM) and IF are most widely used methods (Burgu *et al.*, 1995).

ELISA is one of the most important methods in the determination of viral antigens. Especially, it used widely calves with diarrhea in feces for the determination of rotavirus (Burgu *et al.*, 1995).

In this study, of the 106 fecal samples examined by ELISA 9 samples (8.50%) were identified as positive. In the study, the rate determined (8.50%) found lower than other studies (Yazici and Akca, 1993; Burgu *et al.*, 1995; Ekik, 2002). We can explain that the ages of calves higher than these studies (Burgu *et al.*, 1995; Yazici and Akca, 1993). The studies Garcia-Sanchez *et al.* (1993), Ekik (2002), Burgu *et al.* (1995) and Alkan (1998) of bovine rotavirus infections showed mostly between the ages of 0-15 days. Although, the feces of control calves between the ages 0-180 days in this study, the presence of rotavirus antigen were determined between the ages 0-15 days in calves. As a result, this is very high proportion.

CONCLUSION

The infection is more common tie-stall barns. It can be explained that common feeding and coexisting in the same environment. The prevalence of disease and increased risk of infection causes overcrowding of animals on tie-stall barns.

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