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Prevalence of PI-3 virus, IBR virus and BRS virus in cattle in some governorates in Egypt

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6- CONCLUSION

Respiratory disease in cattle is an interaction between the infectious agents, whether bacterial, viral or both, the environment and immunity of the individual animal. The important viral causes of respiratory disease are infectious bovine rhinotracheitis, bovine respiratory syncytial virus and parainfluenza-3 virus. These viruses can cause disease by themselves or by damaging the defense mechanisms of the upper respiratory tract which predisposes to secondary bacterial infections of the lungs. There are a large number of bacteria that can causes either primary lung disease or secondary to viral compromise of the lung defense mechanisms.

It was obviously clear that respiratory viruses are the common participants in bovine respiratory disease (BRD) which mainly affects young calves in a high extent. It is very difficult to control the disease in small breeders or farmers as the hygienic measurements and sanitation were excluded may be due to ignorance or poverty which makes it difficult to control the disease. The contrary occur in large scaled farms which breed stocks these farms are organized and the sanitary and hygienic measurements were restrict applied as well as vaccination programs which is conducted by vaccinating pregnant dams at the last term of pregnancy to transfer passive immunity to the offspring enabling him to resist infection for the first critical time of life, then followed by active vaccination.

Three viruses had been isolated from the sera collected from animals in different governorates in animals showing respiratory manifestations as well as apparently healthy animals.

It was concluded from the results obtained in this study that vaccination programs should be applied restrict to calves during the critical periods of their lives in which the passive immunity transferred to them from their dams declines when colostrum feeding was stopped, also pregnant dams should be vaccinated at the late stage of pregnancy to transfer immunity to the new coming offspring enabling them to withstand the surrounding stresses during the early period of life.

5-DISCUSSION

Bovine respiratory disease complex is one of the major multifactorial diseases which are a worldwide well known disease causing serious problems which faces beef and dairy cattle breeders. It causes higher economic losses due to the high mortality rate among younger calves or the high morbidity rates which cost the breeder due to the high costs of medicaments beside the loss of body weight.

The bovine respiratory disease (BRD) includes several syndromes that have been defined according to different epidemiological conditions. BRD occurs most frequently in young calves, during the period between passive and active immunity. The disease then called enzootic pneumonia (**Radostitis et al., 2000**). When in contact whole cattle populations are naïve to specific infection, BRD epizootic occure, thet they severely affects both calves and adults (**Elvander, 1996**).

Seroepidemiological studies were carried out on serum samples obtained from seven different governorates, from clinically sick animals from (ElMenofia-ElSharkeya-ElDakahlia and ElIsmailia governorates) and from apparently healthy animals from (Shark Alowaynat, Cairo and El-Behaira governorates). Serum samples were used for studying the incidence of existence of some viral agents causing respiratory complications such as infectious bovine rhinotracheitis Virus (IBRV), parainfluenza -3 virus (PI-3 V) and bovine respiratory syncytial virus (BRSV), by detecting the antibodies against each virus under study in the serum samples obtained.

Screening of the sera for the detection of specific antibodies existing against the viruses previously mentioned was conducted by using SNT and ELISA.

The results of SNT as shown in Table (2) and Figures (1 & 2).

IBRV seroprevalence: among animals showing respiratory manifestations the highest incidence for IBRV antibodies was (45.8%) which was at El-Sharkia governorate, while the lowest incidence was at El-Ismailia which was (40%) with a mean incidence percent (42.03%), while the incidence of IBRV antibodies in apparently healthy animals were higher (38.3%) in Cairo governorate, while the lowest incidence (30%) was in El-Behaira governorate with a mean incidence percent (36.01%).

The results of incidence of IBR antibodies were in agreement with **Ghirotti et al. (1991)** who found that the sera prevalence of IBR/IPV was (41.1%) which is (42.03%) as a mean positive in our study, which is also relatively nearer to the results by **Galiero et al. (2001)** who found that (43.2%) of sera samples were positive to IBRV.

Yavru et al. (2005) found that the prevalence of IBR/IPV was 57.08% which is higher than that obtained in this study. **Amal et al. (2000)** found that the incidence of IBRV antibodies were 23% in Red Sea, 2% in Beni-Suef and 4% in Kenna governorates. These results were obviously very low in comparison with the results obtained in this study.

In apparently healthy animals in this study the incidence percentage was 36.01%. **Anita and Anita (2006)** recorded that the incidence percentage of IBRV antibodies was (68.42%) which is higher than that obtained in this study. The positive results could be explained by the

presence of the virus in bovine herds in which the disease had a subclinical evolution.

PI-3 V seroprevalence: the seroprevalence of PI-3 V antibodies in animals showing respiratory manifestations was higher (64.16%) at El-Menoffia governorate while lower (22.5%) in Dakahlia governorate with a mean incidence of (44.40%) among the four governorates. While in apparently healthy animals was higher (30%) at El-Behaira governorate and lower (25%) at Cairo governorate with a mean incidence of (28.25%). The results of animal showing respiratory manifestations agreed with **Nawal Youssef (1997)** who found that the prevalence of PI-3 antibodies in some cases of pneumonia among calves was 63% which agreed with that obtained (64.16%) at El-Menofia governorate. The results disagreed with **Nilly (2000)** who found the seroprevalence of PI-3 in her study was (19.48%).

The results obtained disagree with **Yavru et al. (2005)** which was (53.95%). **Ghram and Minocha (1990)** found that the incidence of PI-3 antibodies was 55.3% which is nearer to that obtained at El-Menofia (64.16%).

BRSV seroprevalence: the highest incidence of BRSV in animals showing respiratory manifestations was (57.5%) at El-Menofia governorate while the lowest incidence (22.9%) at El-Sharkia governorate with a mean total of 37.06% among the four governorates, while in apparently healthy animals the highest incidence (44.6%) was detected at Shark Alowaynat, while the lowest incidence (20%) was detected at El-Behaira governorate, the mean total percent was (34.62%) among the three governorates.

The results obtained by **Obando et al. (1991)** in that the prevalence of BRSV antibodies was (85 ± 3 %) higher than our results. While **Catalan et al. (2005)** found that the seroprevalence of BRSV was 6.9% which disagreed with the results obtained in this study.

Yavru et al. (2005) found that the prevalence of BRS antibodies was 46.06% which is closer to the results obtained at Shark Alowynat which is (44.6%). The results obtained by **Obando et al. (1999)** that the seroconversion to BRSV were 26% which is nearer to our results at El-Dakahlia (23.75%).

The results of our study disagreed with **Waldmeskel et al. (2001)** who found that the prevalence of BRS antibodies was 92.5%. The results obtained by **Allam (2002)** who had studied the prevalence of BRSV antibodies among calves in different governorates in Egypt, the incidence was 41.5% which is higher than that recorded in this study.

The results of ELISA as described in Table (6) and Figures (3&4). The incidence of antibody titers against viral agents under study was determined also by ELISA, the results were illustrated as follow:

Seroprevalence of IBRV: in animals showing respiratory manifestations, it was higher (47.2%) at El-Sharkia governorate while the lowest percentages were at El-Ismailia (41.1%) with mean total percentage (42.66%).

In apparently healthy animals the highest prevalence (39.7%) was detected at Shark Alowynat, while the lowest incidence (33%) was detected at El-Behaira governorate, the mean total percentage is (37.6%).

The results recorded by **Mween et al. (2003)** who had examined serum sample by using ELISA kit found that the mean prevalence of antibodies was (48.28%) which is higher than that recorded in this study. The higher prevalence may be referred to that the cattle were driven to markets which remarks that cattle could easily spread the virus in transit to markets which were reactivated by stress of transport for long distances under unfavourable conditions.

The results by **Nilly Omar (2002)** who studied the seroprevalence of IBRV and PI-3, BRSV in Egyptian governorates by using ELISA, it was (22.68%) for IBR which is lower result than that recorded in this study. Also, **Solis-Caladeron et al. (2003)** recorded the seroprevalence of IBR antibodies in the serum of none vaccinated beef cattle was (54.4%) which is higher than the results recorded in this study. **Chinchkar et al. (2002)** found that the prevalence of IBRV antibodies by using ELISA was (31%) which is nearer or a little lower than that obtained in this study. **Catalan et al. (2005)** studied the seroprevalence of IBR among cattle by using ELISA and found that the incidence of IBRV antibodies were (16%) which is lower results. **Lazic et al. (1998)** detected the specific antibodies against BHV-1 by ELISA, he found the prevalence was (77%). The serum samples were driven from a herd with a history of vaccination. The results were higher than the results obtained in this study; this may be due to the vaccination program committed by the farmers.

Seroprevalence of PI-3 virus: the results recorded in animals showing respiratory manifestations by using ELISA, the highest incidence percentage was (64.1%) in El-Menofia governorate, while the lowest incidence was (22.9%) in El-Dakahlia governorate. The mean incidence

percentage was (44.9%). The results of ELISA among apparently healthy animals, the highest incidence percentage was (31%) at El-Behaira governorate, while the lowest incidence percentage was (25.8%) at Cairo governorate, the mean incidence percentage was (29.36%). **El-Sabbagh et al. (2000)** found that the incidence percentage of PI-3 (45%) at Kaliobia governorate which is in disagreement with that obtained in this study. **Amal et al. (2000)** found that (20%) of animal sera were positive to PI-3 by using ELISA, this results was lower than that in this study. **Nilly Omar (2002)** found that the seroprevalence of PI-3 V by using ELISA was (19.48%) which is lower than that in the study.

Blender et al. (2003) recorded the incidence of PI-3 virus, it was 20% which is moderately nearer to or lower than that obtained in apparently healthy animals which was 28.8%, his study was commited on wildlife which can introduce the disease by acting as a reservoirs of endemic diseases.

Obando et al. (1999) detected PI-3 antibodies by using HI, the seroprevalence percentage was $(49 \pm 2\%)$ which is slightly than the results obtained in this study.

El-Sabbagh et al. (2000) carried out an epidemiological study on some viral diseases on (316 buffaloes and cows), calves in Kafr ElSheikh, Kaliobia, Dakahlia, Domyat, Beni-Suef and New Valley governorates. The incidence of respiratory viral agents were 37.78%, 30.43%, 73.47% and 26.08% in Hafr ElSheikh and 30%, 42%, 45%, 20% in Kaliobia, in buffalo calves, while in cow calves 43.75%, 45%, 51.25% and 30% in Dakahlia and 33.84%, 43.07%, 49.23% and 27.69% in Domyat and 40%, 35%, 60% and 30% in Beni-Suef for BVD, IBR, PI-3 and BAV 3 viruses antibodies.

The results of IBRV antibodies were to some extent nearer to the results of this study (42.66%) as well as PI-3V antibodies which were (45, 51.25 and 49.23%) in the three governorates with a mean percentage 48.49% which is a little higher than that obtained in this study (44.9%).

Seroprevalence of BRSV: among animals showing respiratory manifestations the highest incidence (59.58%) was recorded at El-Menofia governorate while the lowest incidence (24.16%) was recorded at El-Sharkia governorate, the mean incidence percentage was (38.9%).

In apparently healthy animals the highest incidence percentage (45.39%) at Shark Alowynat, while the lowest incidence percentage (23%) was detected at El-Behaira governorate, the mean incidence was (36.28%).

Waldmeskel (2000) reported the seroprevalence of BRSV in cattle the seroprevalence rate (92.5%) in Ethiopia, it is very high result may be refer the free range life in which the disease can be easily transmitted.

Nilly Omar (2002) found that the seroprevalence of BRSV was (12%) among cattle and buffaloes by using ELISA technique. The results were lower than that obtained in this study.

Allam (2002) studied the prevalence of BRSV and found the incidence percentage was 41.5% which a little bit higher that may be due to age differences among the sample understudy or calves born to vaccinated dams. **Catalan et al. (2005)** reported the incidence of BRSV antibodies by using ELISA technique which was 6.9% and this result is very low percentage.

Obando et al. (1999) found that seroconversion to BRSV was 26% which lower percentage than that obtained in this study. **Shalaby et al.**

(2002) recorded the incidence percent of BRSV antibodies by using ELISA was (37.5%) which agreed with our results. **Sauskare and Byer (2002)** detected antibodies against BRSV by using competitive inhibition ELISA (CELISA) the incidence percentage was 92% which is very high. Also **Driemeir et al. (1997)** found that (79%) serum samples were positive to BRSV antibodies by ELISA in serum of clinically sick animals, the incidence percentage declined after 6 months into 17%. The drop in incidence percentage may be due to the recovery of animals and the animal progressed in age and consequently the drop of antibody level is a consequent result.

Comparison between SNT and ELISA results which were measured by a mean of relative sensitivity percent and relative specificity percentage, it was found that the ELISA results were more specific and more accurate than SNT. These results were a little lower than that obtained by **Allam (2002)** who found that the sensitivity was 98.8 for and specificity 99.1% for BRSV antibodies.

Trials for isolation of viruses from nasal swabs and buffy coat (Table 2): nasal swabs and buffy coat were obtained from calves showing respiratory disorders, a total of 181 samples were inoculated into MDBK tissue culture, a three successive subculture has been carried out samples that showed CPE, positive CPE samples had been identified by using virus neutralization test (VN), 17 samples were positive to IBR with a percentage of (23.6%), **Yangue et al. (1988),** and **Carlo et al. (2004)** isolated IBRV from conjunctiva and nasal swabs. **El-Hassan et al. (2005)** isolated IBRV from five cases with a typical signs of the disease. Parainfluenza-3 virus (PI-3 V) has been isolated from (29) samples with a percentage of 40.2%.