Clinical Prevalence of Peste Des Petits Ruminants (PPR) Disease in Small Ruminants at the Urban Areas of Hyderabad, Sindh

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Abstract: Peste des Petits Ruminants is a highly contagious viral disease of small ruminants, caused by Peste des Petits Ruminants virus (PPRV), spreading worldwide in these days. Thus, current study was planned to check the prevalence percentage of PPR in small ruminants especially in goat and sheep surrounding the urban areas of Hyderabad district of Pakistan. A total of two hundred goat (n=200) were examined during study period. The highest prevalence percentage was observed for PPR (35%) followed by respiratory tract infection (17%), urine incontinence (10%), tympany (9.5%) and indigestion (6%). The prevalence percentage of fracture (1.5%) was lowest among all followed by retained placenta (2%), dystokia (2.5%), mastitis (3%) and abortion (3.5%). Whereas, wound (4.5%) and enterotoxaemia (5.5%) showed moderate prevalence. Similarly, a total two hundred sheep (n=200) were examined and prevalence of different disorders in sheep was found quietly different from the goat. The PPR appeared to be most prevalent problem (30%) in sheep too followed by indigestion (15.5%), respiratory tract infection (13.5%), tympany (12.5%) and wound (7.5%). Fracture appeared as least prevalent problem (1%) followed by dystokia (1.5%), retained placenta (3%), mastitis (3.5%) and abortion (5%). The moderate prevalence was of enterotoxaemia (7%); where, as prevalence of urine incontinence was recorded zero (0%). Overall Prevalence percentages of different disorders in both species indicate that PPR (32.5%) appeared as most prevalent disease followed by respiratory tract infections (15.25%), tympany (11%), indigestion (10.75%) and enterotoxaemia (6.25%). Furthermore; fracture appeared as least prevalent complaint (1.25%) followed by dystokia (2%), retained placenta (2.5%), mastitis (3.25%) and dystokia (4.25%). As for as urine incontinence (5%) and enterotxaemia (6.25%) are concerned, their prevalence was found moderate. No doubt PPR is one of the major emerging issue for small ruminant production therefore current study was planned to provide a proper baseline information so that infected heads could be identified on very early stage for their timely cure and prevention.

Keywords: Pneumonia, anamnesis, diagnosis, contagious disease, auscultation.

INTRODUCTION

Peste des Petits Ruminants is a highly contagious viral disease of small ruminants, caused by Peste des Petits Ruminants virus (PPRV) which belongs to the genus Morbillivirus and family Paramyxoviridae [1]. It is also known as goat plague or sometimes kata, pseudo-rinderpest and stomatitis-pneumoenteritis complex [2]. PPRV is antigenically resemble to rinderpest virus (RPV); therefore, clinical and pathomorphological symptoms produced by these two viruses are also relevant [3].

In general, fever; anorexia; ulcerative stomatitis; diarrhea; oculo-nasal discharges; cough and pneumonia are considered as characteristic symptoms of this disease [4]. Although, goats are most susceptible; but involvement of sheep is also not exceptional [5]. There are also clues that adults are less susceptible than young animals [6]. This disease was once thought to be a fairly restricted problem in West Africa, but now; it is known to exist in Central and East Africa, reaching eastwards through Western and South Asia [7]. In Pakistan, during the last few years, PPR outbreaks have increased to an alarming level covering several newer areas [8] and it has been serologically confirmed too. The overall reported prevalence rate is about 50% in small ruminant population [9, 10, 11]. In addition, molecular studies have also been carried out on PPR Virus from various outbreaks in Pakistan to check its genetic makeup and characteristics, and that indicate PPRV belong to lineage IV [12, 13].

Transmission of PPRV in the herd occurs by “direct contact” route; especially when new PPR infected animals are introduced [14, 15]. After onset of clinical signs virus starts to be excreted through salivary secretions, oculonasal discharges and feces [15].

The pathological studies on PPRV showed that after entrance through respiratory system, this virus

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ISSN: 1814-8085 / E-ISSN: 1927-5129/17

localizes in pharyngeal and mandibular lymph nodes first and then in the tonsils. Subsequent viremia results this virus to be distributed to visceral lymph nodes, spleen, bone marrow, and the mucosae of the gastrointestinal and respiratory systems and clinical signs start to appear [15]. The incubation period usually ranges from 2 to 6 days. However, before fever and mucosal erosions occur, diarrhea occurs two to three days later and usually death is preceded by pneumonia [16].

The morbidity and mortality rates usually vary in non-endemic areas depending upon susceptible population. In severe cases mortality and morbidity percentage may reach up to 90 and 100%, respectively [17].

Due to increasing economic losses because of PPR, need of eradication programme is being felt on emergency basis [18, 19, 20, 21]. Although; effective diagnostic tools and vaccines are now available but they must be properly utilized so that disease can be eradicated not only from the country but world too. Infect FAO and OIE have now planned to eradicate PPR from the global by 2030 [22].

Keeping in view all aspects of PPR, current study was planned to check the prevalence percentage of PPR in small ruminants especially goat and sheep surrounding the urban areas of Hyderabad district, so that infected heads could be identified on very early stage to carryout proper and timely curative and preventive measures.

MATERIALS AND METHODS

Location of Study

The study was carried out at Steele Veterinary Dispensary during 15th January to 14th February 2015. This Dispensary is basically located close to City Gate of Hyderabad, Sindh. Although, multiple species were brought at the Dispensary during study period but amongst them goat and sheep species were selected for current study.

Methods Used for Disease Diagnosis

Several methods were used for disease diagnosis in the current study including history taking (Anamnesis), use of clinical thermometer, physical examination, auscultation and differential diagnosis. The detail of all methods is given below:

1. History of Patient (Anamnesis)

History taking was used as a basic tool for the disease diagnosis. Whenever any affected goat or sheep was presented at the Dispensary, first of all history was asked from the owner of the patient. The information was taken regarding patient itself, herd, disease and surrounding environment. Different sort of questions were asked from owner about complaint, so that better diagnosis could be made. Certain specialized questions were also asked for differential diagnosis. Few examples of questions are: When from complain was noticed? Is this a herd problem? Is there any diarrhea or constipation? Is there blood in the feces or Urine? Is micturition normal? What is walking style? What is the sitting style? Was the feed intake normal? What was provided in feeding? Are there any lesions in the mouth? Is there any problem in respiration? How many animals are affected in herd? Is animal Pregnant? When animal parturited? When vaccination was performed? What kinds of vaccine were used? etc.

2. Clinical Thermometer

Clinical thermometer was used to check the Per-rectal temperature of patient, and played key role in diagnosis of bacterial, viral and parasitic infections. If temperature was found below the normal range then it was assumed that patient is suffering from parasitic infection, but when temperature was above the normal range then it was assumed that patient is suffering from bacterial infection. Patients with Sharp rise of body temperature to 104°F–106°F were assumed to be affected with PPR.

3. Physical Examination

Aside from history taking and clinical thermometer, physical examination of the patients also played key role in disease diagnosis. Physical examination of animals was performed by observing the animals at the distance of 1-1.5m. Walking style, sitting style, defecation, urination, respiration and behavior of patient were the key points for observation.

4. Close Inspection

Patients were closely inspected in order to record the presenting signs of different diseases like PPR. Site of mouth cavity, tongue, nostrils, eyes, corners of lips were closely examined. Any kind of lesions inside the mouth cavity, tongue and corners of lips were noted. Eyes and nostrils were closely inspected for any kind of oculo-nasal discharge. Furthermore; animals were

examined for any sort of swelling, inflammation, abscess, wound or any sort of external parasites on the surface of body.

5. Auscultation

Stethoscope was used to record tracheal and lungs sound or any kind of respiratory distress. PPR affected patients were assumed to be having difficulty in respiration and sound was producing from the trachea and lungs during inhalation phase of respiration.

6. Differential Diagnosis

Sudden high fever (104°F–106°F), oculo-nasal discharge, difficulties in breathing, non haemorrhagic diarrhea, rough hair coat, characteristic foul smell from mouth, erosions in the mouth cavity, severe dehydration and emaciation followed by hypothermia, pale, obscure lining of the mouth [23], were used as characteristic symptoms to differentiate the cases of PPR from other diseases.

Data Collection and Analysis

During study period of one month, different species of animals were brought at the dispensary with different complaints. Amongst those, total number of affected goat and sheep was recorded on daily basis till one month period of time and heads affected with PPR were identified and recorded separately. Total recorded number of goat and sheep was found four hundred (n=400), with two hundred goat (n=200) and two hundred sheep (n=200).

The prevalence percentage of PPR in the goat was calculated by using the formula: Prevalence Percentage = Number of PPR affected goat/Total Number of goat brought *100; while, in sheep by using formula: Prevalence Percentage = Number of PPR affected sheep/Total Number of sheep brought *100. The overall PPR prevalence percentage was calculated by using formula: Prevalence Percentage = Number of PPR affected goat + sheep/Total Number of goat+ sheep *100. Same way by using above mentioned formulas prevalence percentages of all other diseases were calculated. Data was analyzed using MS Excel of Microsoft Office version 2013.

RESULTS

Prevalence of Different Diseases in Goat

A total of two hundred goat (n=200) were examined during study period and prevalence percentages of different disorders are presented in (Figure **1**), which show the great variability. Result indicates that highest prevalence percentage was observed for PPR (35%) followed by respiratory tract infection (17%), urine incontinence (10%), tympany (9.5%) and indigestion (6%). The prevalence percentage of fracture (1.5%) was lowest among all followed by retained placenta (2%), dystokia (2.5%), mastitis (3%) and abortion (3.5%). Whereas, wound (4.5%) and enterotoxaemia (5.5%) showed moderate prevalence compared to all (Figure **1**).

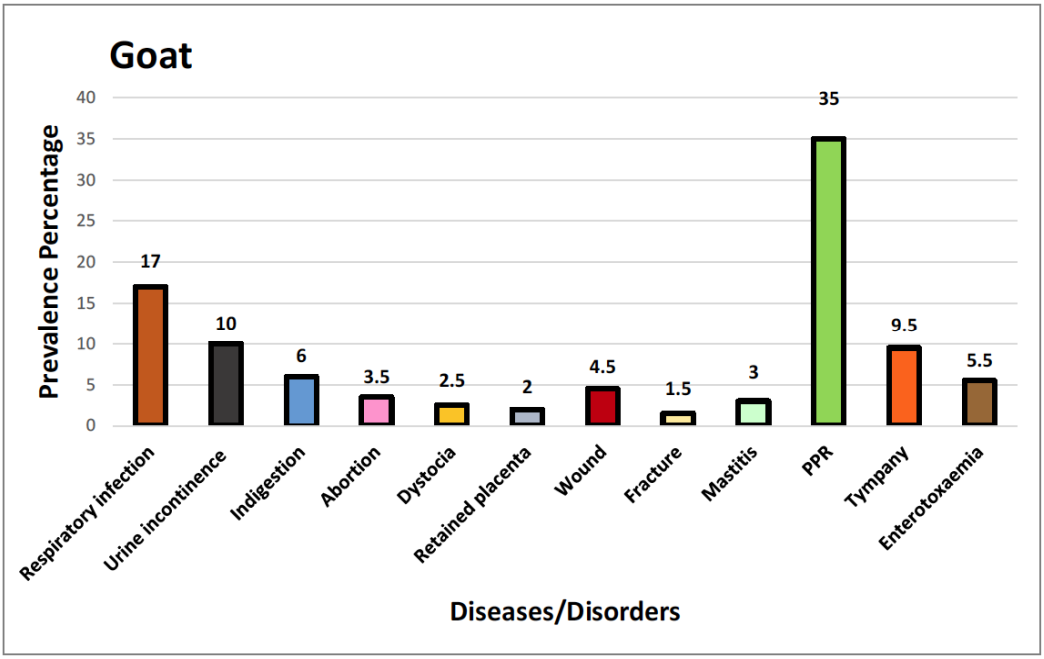

Figure 1: Prevalence percentages of different diseases/disorders in Goat.

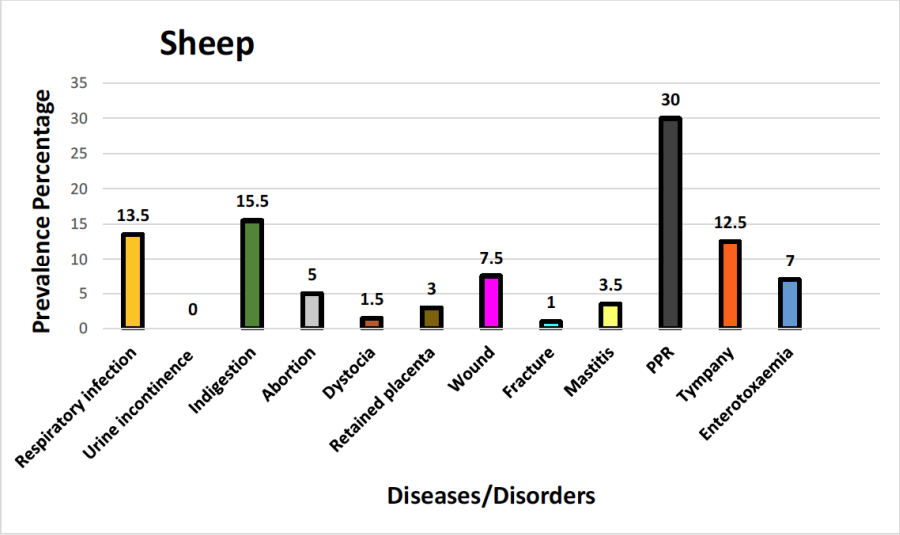

Figure 2: Prevalence percentages of different diseases/disorders in Sheep.

Prevalence of Different Diseases in Sheep

A total two hundred sheep (n=200) were observed during study period and prevalence of different disorders in sheep was found quietly different from the goat as presented in (Figure **2**). It shows that PPR appeared to be most prevalent problem (30%) in sheep too followed by indigestion (15.5%), respiratory tract infection (13.5%), tympany (12.5%) and wound (7.5%). Fracture appeared as least prevalent problem (1%) followed by dystokia (1.5%), retained placenta (3%), mastitis (3.5%) and abortion (5%). The moderate prevalent problem was enterotoxaemia (7%); where, as prevalence of urine incontinence was recorded zero (0%) (Figure **2**).

Prevalence of Different Diseases in Goat and Sheep

Overall prevalence percentages of different disorders in both species; goat and sheep are presented in the (Figure **3**). Results indicate that PPR (32.5%), once again appeared as most prevalent complaint in both species followed by respiratory tract infection (15.25%), tympany (11%), indigestion (10.75%) and enterotoxaemia (6.25%). Furthermore; fracture appeared as least prevalent complaint (1.25%) followed by dystokia (2%), retained placenta (2.5%), mastitis (3.25%) and dystokia (4.25%). As for as urine incontinence (5%) and enterotxaemia (6.25%) are concerned, these were appeared as moderate prevalent complaints (Figure **3**).

DISCUSSION

PPR is one of the major problems which severely affect the health and productivity of small ruminant's population not only in the Pakistan but throughout the world. Losses caused by PPR most probably depend on the management practices, nature and intensity of infection. In the current study, prevalence of PPR in two domesticated species including goat and sheep was examined in the urban areas of Hyderabad district of Pakistan, in order to determine the severity of infection. Although, same kind of studies have already been reported by other scientists not only in Pakistan but throughout the world too. However, those workers have recorded certain other aspects of PPR like prevalence of Peste des Petits Ruminants virus antibodies [24], response of PPR towards antibiotics treatment [25], seroprevalence of PPR [26], evaluation of efficacy of PPR live attenuated vaccine [27], sero-epidemiological study of Peste des Petits Ruminants, its control and eradication [28], Molecular characterization of Peste des Petits Ruminants viruses [29], Isolation and characterizationof lineage-IV PPR virus strains [30], and seasonal variation of PPR prevalence [31], etc. The regional variation may be attributed to different geographical distributions, host factors, climatic conditions, host age, sex and breeding status, grazing habits, the standard of management and use of antibiotics.

In the current study, when goat and sheep were recorded for different kind of disorders, then amongst all PPR found predominantly and appeared to be most prevalent problem in the urban areas of Hyderabad. Furthermore, fracture and urine incontinence appeared as least prevalent problems in goat and sheep population, respectively. When prevalence percentages of different disorders were calculated in both species

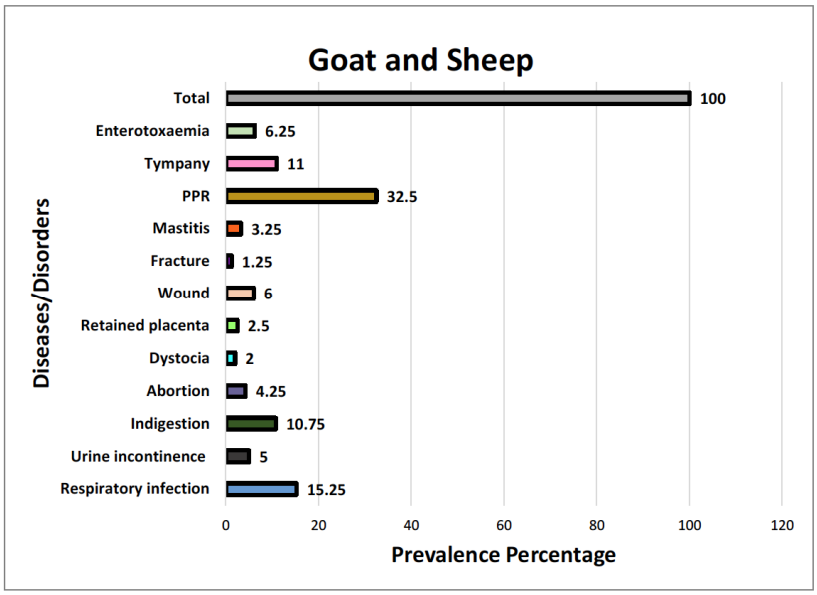

Figure 3: Prevalence percentages of different diseases/disorders in Goat and Sheep.

together then, still PPR appeared as predominant disease amongst all and fracture post-dominant.

No doubt, current study suggests the baseline information for further studies on PPR and its different aspects in different areas. Based on the current study it has been recognized that PPR is becoming a major arising issue of small ruminants like goat and sheep in urban areas of Hyderabad. There is quick need of control and eradication programmes for PPR in urban areas of Hyderabad to protect species of goat and sheep to be deteriorated. Infect, on basis of current study, it seems possible to formulate the standard preventive and curative management strategies to eradicate PPR from the base.

CONCLUSION

On the basis of current study it is concluded that Pest des Petitis Ruminants is appearing as an emerging threat for the goat sheep population in the vicinity of Hyderabad. There is quick need of preventive and curative steps to be followed for protection of goat and sheep pedigrees. Furthermore; on the basis of current findings it is advised to aware livestock farmer regarding all preventive measures of PPR. So that goat and sheep enterprize can be uplifted.

ACKNOLWEDGEMENT

We are thankful to Dr. Siraj Ahmed Esani Deputy Director, Dr. Ghulam Hussain Jeelani vetrinary officer/ incharge and all other staff members of Steele veterinary Dispensary Hyderabad for their kind cooperation, appreciations and providing a conducive environment and research facility for current study.

AUTHOR'S CONTRIBUTION

Asad Ali Khaskheli: Carried out research project and draft the manuscript.

M. Ibrahim Khaskheli: Helped in paper write up.

Allahjurio Khaskheli: Contributed in analysis of data.

Gulbhar Khaskheli: Contributed in citation of paper.

Rani Abro: Contributed in setting the paper according to format of Journal.

Ghulam Shabir Barham: Helped in reviewing the paper.

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Received on 08-12-2016 Accepted on 10-05-2017 Published on 31-05-2017

https://doi.org/10.6000/1927-5129.2017.13.46