دراسة عن مقاومة الأغنام العراقية للعدوى بديدان الرئة

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استخدم في هذه التجربة عدد ١٦ رأس غنم أعمارها من ٢-٣ شهر ولدت بمزرعة كلية الطب البيطري ببغداد . تم تربيتها تحت ظروف صحية بعيدة عن العدوى بالطفيليات. قسمت هذه الحيوانات الى أربع مجاميع أ ، ب ، ج ، د .

تم عدوى المجموعة أ للمرة الثانية في اليوم السابع من العدوى الأولى ، كذلك تم عدوى المجموعة ب في اليوم ٢٨ من العدوى الأولى حينما ظهر الطور اليرقي في براز الحيوانات الصابة . أما المجموعة ج أصيبت مرة واحدة وتركت المجموعة د بدون اصابة .

وبذلك تكون المجموعتين ج ، د ضوابط المجموعتين أ ، ب .

فحصت هذه الحيوانات اكلينيكيا ومن خلال ذلك تم وزن الحيوانات وفحص برازه قبل وجد العدوى أسبوعيا .

وبعد فترات محدوده تم ذبح الحيوانات وسجلت الصفة التشريحية لها .

وكانت النتائج كالاتي :

١) ظهر اعراض التهاب الجهاز التنفسي في جميع الحيوانات الصابة بعد العدوى الأولى بثلاث اسابيع واستمرت الاعراض في الحدة والتغيرات مدة التجربة في جميع الحيوانات التي أصبحت لديها مقاومة .

٢) وجد أن نصف عدد اغنام المجموعة ب لم تكون أي مناعة وكان نتيجة ذلك ان العدوى الأولى والعدوى الثانية تمت ووصلت الى الطور الكامل لديدان الرئة في مدة شهرين .

أما النصف الثاني من نفس المجموعة تكونت لديه مقاومة ادت الى تخلصه من ديدان الرئة للعدوى الأولى جزئيا او كليا وكذلك منحت نمو العدوى الثانية الى الطور الكامل وغالبا ماتم ذلك في الجهاز الليمفاوي .

٣) ظهرت هذه المناعة أو المقاومة في خلال اسبوع من العدوى الثانية بعد أن أصبحت العدوى الأولى في الطور الكامل .

٤) لم تتكون أى مناعة بايـة صورة فى أغنام المجموعة أ بعد ٧ أيام من العدوى الأولـى وبذلك تم نمو العدوى الأولى والثانية الى الطور الكامل بعد ٣٥ يوم ـ هذه النتيجـة غالبا لم يذكرهـا البـاحثون من قبـل ٠

من هذه النتائج يتضح ان الأغنام العراقية تختلف عن الأغنام الأوربية فى تكوين المناعـة والمقاومـة للعـدوى الثانيـة بديدان الرئـه ٠

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STUDIES ON RESISTANCE OF IRAQI-SHEEP TO DIGTYOCAULUS FILARIA INFECTION

(With One Table and 2 Figures)

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SUMMARY

The resistance of Iraq-sheep to D.filaria was studied on sixteen lambs. Wide variations in degree of resistance were observed. Solid immunity was developed by two lambs resulted in partial or complete elimination of worm burden of initial infection when challenged 28 days post primary exposure, while other two lambs failed to do so.

The resistance was initiated in challenged lambs within seven days after patency of primary exposure whereas those lambs re-infected before patency of initial infection were unable to evoke any degree of resistance.

Immune mechanism in the resistant lambs appeared to operate in migratory pathway from mesentri lymph nodes to the lungs.

The resistant lambs showed respiratory distress similar to those shown by non-resistant and control infected animals possibly due to the high susceptibility of this bread to secondary bacterial pneumonia.

INTRODUCTION

Verminous bronchitis is widely distributed in sheep in Iraq. D. filaria is considered the most important causative agent (KADHIM, 1975).

British sheep reported to be insusceptible to re-infection with D. filaria when recovered from an attack of parasitic bronchitis (MICHEL, 1956 and WILSON, 1970).

These manifestations of resistance were studied here in native bread sheep through exposure of experimentally infected lambs with 50 Larvae/Kg. b.wt. to subsequant challenge of 100 larvae/Kg. body weight of D.filaria. Furthermore, the clinicopathological changes which accompanied initial and challenge infections were investigated.

MATERIALS AND METHODS

INFECTIVE LARVAE:

Lungs of sheep infected with D.filaria were dissected and worms were obtained. Eggs and larvae were collected from gravid uteri, washed, resuspended in water, and kept at room temperature. Infective larvae developed within 7 days. Doses were determined by counting a number of larvae per ml.of homogenous culture medium. The infection were given orally by a rubber pipette.

EXPERIMINTAL LAMBS:

Sixteen crose-breed (Karadi X Oasi) Iraqi-lambs, 2 to 3 months old were used in this experiment. They were born at the Farm of College of Vet. Med., University of Baghdad. They were reared indoor pens and maintained under such condition of cleanliness as would preclude the possibility of parasitic infections. Only dry ration was used. The lambs were divided into four groups. The design of experimental plan are shown in Table 1. The principale of the experiment was intended to

challenge experimentally infected lambs on day 7 and 28 post-primary exposure. Re-infected lambs and their controls were killed at different periods to investigate the fateof invading larvae and the stage of active immunity.

Data on clinical sysptoms, body weight and faecal larval count were obtained at weekly intervals post-infection.At necropsy, the lungs,trachea and larynx were opened and worms were removed with forceps. The lungs then minced and baermanised. The mesentric lymph nodes were cut with scissors into small pieces and placed on modified Baermann apparatus. The filterate was examined microscopically for larvae according to the method described by REINECKS (1967).

Gross pathological changes in the lungs were recorded.

CLINICAL FINDINGS:

The inoculated lambs appeared normal during the first two weeks following infections. On the third week, they showed diminished appetite, intermittent cough and harried respiration. Ausculatation revealed harsh bronchial respiration with emphysematous crackling. The clinical signs of respiratory distress progressed by the fourth week enward. Coughing became more frequent, a significant increase in pulse rate concomittant with rise of body temperature.Dyspnoea accampanied by voilent respiratory heave and grunt were evident. Rhonchi and emphysematous crackling sounds could be heard over the harsh bronchial breathing. All the lambs recieving a single or double doses of D. filaria larvae lost their weight gradually except the resistant lambs in group B during the second week post-challenge showed improvement in the body weight approximately similar to the control non-infected lambs (Fig. 1). The

clinical signs of respiratory illness persisted in all infected animals with continuous rise of body temperature during the experimental period. These were responsible for bad condition exihibited by the lambs in groups A, B and C.

The uninoculated controls remained healthy and made normal weight gain during the experiment.

FAECAL LARVAL COUNT:

The maximum individual larval counts are shown in Table 1 and the mean for groups were illustrated in Fig. 11. It observed that the larvae started to discharge on the fourth week.The number was decreased gradually by the resistant lambs in group B in comparable with the huge number voided by non resistant lambs in the same group and control infected animals (group C). The lambs in group A showed tremendous rise in larval count with the fifth week post-infection.

WORM RECOVERY:

Table 1 shows the number of recovered worms from each lamb slaughtered at definite period. The lambs in group A showed a high worm burden on day 35 after infection in comperable with the lamb 15368 and 212 in group C. These might be due to patency of first and second infections. The lamb 382 and 208 in group B re-infected after potency of initial infection developed 0.0 and 38 worms on 7th and 31th days after challenge respectively. At meantime the other two lambs in the same group after one month of challenge gave a count approximately twice the number recovered in control lambs 2 and 276.

Immature worms could not be recovered from mesentric lymph nodes of the lamb 314 (group C) salaughtered after 7 days

from intial infection. On the other hand the same result was observed in the lamb 382 slaguhtered on seventh day post-challenge.

LUNG PATHOLOGY:

Lung consolidation (hepatization) was present nearly of the same degree in apical, cardiac and diaphgramatic lobes of all animals exposed to either single on double infections. Emphysema was the more pronounced pathological changes noticed in the diaphgramatic lobes.

DISCUSSION

The evidence presented here would seem to demonstrate that Iraqi-lambs experimentally infected with D. filaria conferred a certain degree of resistance to the second infection but wide vartiations of responce was apparant. A high degree of resistance was developed by the lambs exhibited by complete and partial elminiation of the worms of initial infection noticed in lambs 382 and 208 in group B respectively. At meantime the lambs 290 and 275 in the same group failed to develop by showing a high number of worm burden at pos-mortum. Uniform results were obtained by JARRAT et al., (1958) with D. viviparus in cattle, while MICHEL (1956) and WILSON (1970) concluded that strong acquired resistance developed by British -sheep infected with D. filaria to subsequent challenge.

The acquired resistance developed rapidly in lamb 382 becoming apparent within seven days after patency of initial infection. Eleven days was sufficient to resistance to be developed in calves challenged with D. viviparus (MICHEL, 1962).

Immature worms could not be recovered from mesentric lymph nodes and lungs of either control infected lamb 314 or the resistant lamb 382 seven days after primary or secondary infections respectively. These results suggest their presence in lymph ways. ANDERSON et al., (1971) found that immature worms of D. filaria. on day seven of infection onward, migrating from mesentric lymph nodes via thoracic duct to heart and pulmonary arteries. Accordingly administered larvae to the resistant lambs appeared to be inhibited in pathway from mesentric lymph nodes to the lungs. In this respect, MICHEL (1956) thought that the nodes might be an important site of resistance but later MICHEL and SINCLAIR (1963) reported that immature worms did not reach the lungs of resistant sheep and the nodes were not essential to the stimulation of resistance.

With regard to the formation of immunity before potency the present study revealed that challenge on seven day after primary exposure failed to initiate immunity and both first and second doses became patent after a period of 35 days. A finding which had not been reported before.

Severe clinical signs of respiratory distress had been observed in the lambs challenged on the 7th and 28th days after initial infection and in control infected lambs. Similar findings had been reported in cattle challenged with D. viviparus 1 to 27 months after initial infection (MICHEL, 1954 ; RUBIN and LUKER, 1959 and MICHEL and COATS, 1958). However, MICHEL (1956) and WILSON (1970) found that resistant lambs to D. filaria did not show clinical, signs of lungworm disease. They attributed these findings to strong immunity produced by sheep against D.filaria infection than did cattle. Accordingly

Iraqi-sheep seems to have individual variations with regard to immunity.Moreover this breed appeared to be very susceptible to secondary bacterial pneumonia which made resistant and non-resistant lambs were suffered from respiratory illness for a long period.

Concering gross pathological changes WILSON (1970) considered reduced lung damage might be useful as an indication of immunity. However, in this study necropsy findings of resistant and non-resistant sheep were of the same degree.These increase in lung pathology of resistant lambs attributed to the development of bacterial pneumonia. These explanations would be confirmed through histo-pathological examinations in further publications.

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