Some parasites causing diarrhea in goats in Beni-Suef Governorate

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A total of 100 fecal samples from goats were coprologically examined to investigate the main cause of diarrhea. Animals were divided according to the age into 3 groups (7-35 days, 35 days - 6month and over one year). The results revealed that *Eimeria* species was the most predominant parasite (70%), the parasitic gastroenteritis (28%) and *Cryptosporidium* species (21%). Ten species of *Eimeria* were identified from the infected animals, *E. hirci, E. arloingi, E. intericata, E. ahsata, E. christenseni, E. marisca, E. crandalis, E. weybridgegenisis, E. faurei and E. ovina*. Three species of parasitic gastroenteritis (*Haemonchus contortus, Ostertagia species and Trichostrongylus* species). *Cryptosporidium oocysts* were found common in young goats.

The goat is one of the most resourceful and efficient ruminants (Mussman, 1982). Moreover, it has easy handling, independence and adaptability to living free, modest feeding requirements, good tolerance to climate in different regions and effective conversion of limited resources into milk, meat and hides are desired factors favouring the goat as a stock animal for small scale farmers (Balicka-Ramisz, 1999; Harper and Penzhorn, 1999). Goat meat is much desired and is considered a delicacy in the diet of the Egyptian people. The level of off-take from goats is higher than sheep (Ndamukong et al., 1987).

Parasitic affections induce severe losses of the productive parameters of goats. System of goat breeding specially by small owners did not apply any medical care for individual animals. There are field infection and reinfection of goats by different parasites. The parasites which were recorded in Egypt in goats include *Haemonchus contortus* (Hassan, 1985) and *Trichostrongylus axi* about 40% (Salem et al., 1991). Parasites of gastrointestinal tract that include, *Haemoncus* and *Trichostrongylus, Bunostomum* were recorded by Shawkat et al. (1991) in Kafer El Sheikh.

Diarrhea is the main symptom associated with these parasitic infections especially in newly born animals. The parasitic infections lead to rapid morbidity of the affected animals that may end with their death. This condition was recorded in high level infectio by parasitic gastroentritis, coccidian and cryptosporidial infection. Coccidiosis is a wide spread serious economic disease affecting pre weaned and recently weaned kids (Foryet, 1990; Dai et al., 1991; Smith and Sherman, 1994, Schafer et al., 1995). Henin (1997) found *Eimíria* species oocysts in 85.92% of the examined goats in Beni-Suef Governorate.

*Cryptosporidium parvum* was found in 100% of newborn kids in Danish goats (Thamsborg et al., 1990). Where Munoz et al. (1994) found *C. parvum* oocysts in feces of 6 out of 45 goat kids. In Egypt, Abou El Hassan, (1996) detected *Cryptosporidium oocyst* in 16.5% of 200 diarrheic goat kids.

The present study spots the light on enteric parasites as a cause of losses and mortalities in goats with special reference to those of less than 2 months old in Beni-Suef city.

**Materials and methods**

**Samples.** A total number of 100 goat diarrheic fecal samples were collected from different localities in Beni-Suef city. The animals age range from 7 days to 4 years. The fecal samples were identified by owner name, locality, age and complain. The fecal samples were transferred directly for examination to the department of Parasitology, Faculty of Veterinary Medicine, Beni-Suef.

**Examination of samples.** Fecal samples were examined using concentration Floatation technique and the eggs were counted using MacMaster technique according to the method described by Soulsby (1982) for counting of PGE eggs and coccidia oocysts per gram feces. Modified Ziehl-Neelsen technique according to Henriksen and Pohlenz, (1981) was applied for diagnosis of Cryptosporidium oocyst.
Results and Discussion

The data in Table (1) revealed that coccidial infection appears as the most common cause of diarrhea in examined goat (70%) followed by parasitic gastroenteritis (28%) and the lowest percent was recorded for Cryptosporidium species (21%). Concerning the relation between age of examined animals and their parasitic infection, Cryptosporidium is the most common one in young animals (gp.1) 50% followed by different Eimeria species (40%) especially in animals suffered from diarrhea. No parasitic nematode eggs could be detected in the examined young goats at the early age. Concerning the animals in gp2 (35 days- 6 months age), the most common infection was by Eimeria spp. 85.71% followed by PGE eggs (28.57%) and Cryptosporidium infection 20%. In gp3 (over one year age), the main diagnosed parasite was Eimeria spp. (71.43%) then PGE eggs in (51.43%) and the lowest parasitic infection was by Cryptosporidium (5.71%). Regarding the mixed infection with these parasites, it was noticed that Eimeria spp. and PGE in two groups (over 35 days and over 6 months age) and was not found in group1 (7-35 days) and higher in gp3 (over one year) 37.14%. On the other hand the study did not detect a relation between kind of parasitic affection and condition of feces except in infection by Cryptosporidium, it appears to be the main cause of diarrhea in young age. The most predominant species of Eimeria in Table (2) was Eimeria intricata (85.71%) followed by E. arloingi (74.28%) and less predominant species were E. marisca, E. ovina and E. faurei (14.28%). The number of oocyst per gram (opg), ranged from 750 to 1250 opg. These numbers decreased with progress in age. It was cleared from table (3), Haemonchus contortus was the most common nematodes appeared in these animals (71.43 %) and also had the higher number of eggs per gram of feces (epg) 650 epg, followed by Ostertagia sp. (35.71%) and 450 epg. The less common nematodes was Trichostrongyulus sp. at (21.43%) and 450 epg. Regarding the age, Ostertagia sp. and Trichostrongyulus sp. eggs appeared in early or more common in young age than Haemonchus contortus, this depend on the wide range host of Ostertagia sp. and Trichostrongyulus, the habits of the young animals to graze any object in the environment and low level of immunity (more susceptible). It was noticed that infection by these nematodes could be mixed Eimeria infection in goats was (89.9%) in adults and 94.0% of kids with OPG of less than 1000. Twelve species of Eimeria were identified. The percentage of animals harbouring different species were: E. alijevi and E. ninakohlyakimovae, 99%; E. hirci, 83.5%, E. arloingi, 80.6%; E. caprina, 77.6%; E. aspheronica, 64.8%, E. ahsata, 63%, E. christenseni, 60%; E. granulose, 42.8%, E. pallida, 6.2%; E. intricata, 2% and E. punctata 0.3%. Two percent of goats harboured three species, 5.6% four, 9.5% five, 26.3% six, 25.7% seven, 23.7% eight, 6.3% nine, 0.6% ten and 0.3% eleven species (Chhabra and Pandey (1991), while Henin, (1998) found Eimeria species infect goats were E. ninakohlyakimovae (69.68%), E. christenseni (51.83%), E. arloingi (50.12%), E. hirci (20.53%), E. caprina (9.77%) in Beni-Suef Governorate. Balika-Ramisz (1999) found 9 species of Eimeria, E. chrestenseni, E. ninakohlyakimovae, E. arloingi, E. jolchijev, E. alijevi, E. asphoronica, E. caprina, E. caprovina and E. hirci. 91% of adults and 100% of kids were infected. Faizal and Rajapakse (2001) recorded Eimeria species in 88% in Kids and 91% of young goats and 83% of adults. Seven species of Eimeria were identified, E. ninakohlyakimovae (31%), E. alijevi (29%), E. arloingi (21%), E. chrestenseni (7%) and E. hirci (3%). More over, Abo-Shehada and Abo-Farieha (2003) found 54% of the examined goats were infected with at least one Eimeria species. More young goats (< 1 year) (66%) were infected with at least one species of Eimeria compared to 49% adult > 1-year-old goats. 8 Eimeria species were identified, E. arloingi, E. caprina, E. alijevi being the most prevalent in the adults, E. ninakohlyakimovae, E. asphoronica and E. caprina being the most common species amongst the kid population. In addition, E. caprovina and E. parva were found common in both age groups. But, Agyei et al. (2004) recorded Eimeria species in goat kids as, E. arloingi (20.50%), E. ninakohlyakimovae (17.2%), E. caprina (15.07%), E. jolchijevi (11.42%), E. aspheronica (8.70%), E. pallida (5.31%), E. hirci (3.20%) and E. chrestenseni (2.84%). Also, the same result reported by Jalila, et al., (1998) in Malaysia and Koudela and

Gastrointestinal nematodes eggs were found in 89% of the kids, 94% of the young goats and 84% of the adult goats, included, Haemonchus contortus (90%) followed by Oesophagostomum spp. (8.9%), Trichostrongylus spp. (1%), Faizal and Rajapakse, (2001), on the contrary with Hassan (1985) and Salem et al. (1991) 40%. Ostertagia circumcinecta and Trichostrongylus axei were the most common species of parasitic nematodes in goats (Torina et al., 2004). But Nwosu et al. (1996) found that the most parasitic nematodes were Haemonchus contortus (90%) and Trichostrongylus sp. (78.3%) in Nigerian goats. Cryptosporidiosis in goats was found to be 29.1% of examined goats, Khalil (2000), while cryptosporidiosis 100% and 37.5% Thamsborg et al. (1990) and Hilali et al. (1998) in KSA respectively. Cryptosporidiosis seems to be mainly a problem in neonatal ruminants and considered to be an important agent in the etiology of the neonatal diarrhea syndrome of goat kids (Graff et al., 1999).

**Table (1): Prevalence of enteric parasites causing diarrhea in goats.**

<table>
<thead>
<tr>
<th>Group age</th>
<th>Form of feces</th>
<th>Exam. no.</th>
<th>Parasitic gastroenteritis</th>
<th>Eimeria species</th>
<th>Mixed infection*</th>
<th>Cryptosporidium spp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-35 days</td>
<td>diarrheic formed</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>7-35 days</td>
<td>diarrheic formed</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>35 day-6 months</td>
<td>diarrheic formed</td>
<td>20</td>
<td>5</td>
<td>25</td>
<td>18</td>
<td>90</td>
</tr>
<tr>
<td>35 day-6 months</td>
<td>diarrheic formed</td>
<td>15</td>
<td>5</td>
<td>30</td>
<td>12</td>
<td>80</td>
</tr>
<tr>
<td>Over one year</td>
<td>diarrheic formed</td>
<td>20</td>
<td>6</td>
<td>40</td>
<td>10</td>
<td>66.66</td>
</tr>
<tr>
<td>Over one year</td>
<td>diarrheic formed</td>
<td>12</td>
<td>60</td>
<td>15</td>
<td>75</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>diarrheic formed</td>
<td>35</td>
<td>10</td>
<td>28.57</td>
<td>30</td>
<td>85.71</td>
</tr>
<tr>
<td>Total</td>
<td>diarrheic formed</td>
<td>100</td>
<td>28</td>
<td>28</td>
<td>70</td>
<td>70</td>
</tr>
</tbody>
</table>

* Mixed infection: infection by coccidia and PGE (parasitic gastroenteritis)

**Table (2): Different types of Eimeria spp. oocysts diagnosed in infected goats.**

<table>
<thead>
<tr>
<th>Type</th>
<th>Measurements Max.</th>
<th>Min.</th>
<th>Mean (um)</th>
<th>No. of infected oats</th>
<th>%</th>
<th>No. OPG (mean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. intricata</td>
<td>49x35</td>
<td>45x30</td>
<td>47x32</td>
<td>60</td>
<td>85.71</td>
<td>900</td>
</tr>
<tr>
<td>E. crandalis</td>
<td>26x18</td>
<td>22x16</td>
<td>24x17</td>
<td>44</td>
<td>62.85</td>
<td>1100</td>
</tr>
<tr>
<td>E. weybridgei</td>
<td>26x18</td>
<td>22x16</td>
<td>24x17</td>
<td>36</td>
<td>51.43</td>
<td>850</td>
</tr>
<tr>
<td>E. marisca</td>
<td>20x14</td>
<td>18x12</td>
<td>19x13</td>
<td>10</td>
<td>14.28</td>
<td>1200</td>
</tr>
<tr>
<td>E. hirci</td>
<td>24x20</td>
<td>22x18</td>
<td>23x19</td>
<td>40</td>
<td>57.14</td>
<td>1200</td>
</tr>
<tr>
<td>E. ahmata</td>
<td>40x26</td>
<td>37x24</td>
<td>39x25</td>
<td>50</td>
<td>71.42</td>
<td>1250</td>
</tr>
<tr>
<td>E. faurei</td>
<td>29x21</td>
<td>27x20</td>
<td>28x21</td>
<td>10</td>
<td>14.28</td>
<td>850</td>
</tr>
<tr>
<td>E. ovina</td>
<td>32x21</td>
<td>30x19</td>
<td>31x20</td>
<td>10</td>
<td>14.28</td>
<td>750</td>
</tr>
<tr>
<td>E. christensenii</td>
<td>38x25</td>
<td>38x25</td>
<td>38x25</td>
<td>20</td>
<td>28.57</td>
<td>900</td>
</tr>
<tr>
<td>E. arloingi</td>
<td>28x19</td>
<td>26x17</td>
<td>27x18</td>
<td>52</td>
<td>74.28</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Table (3): Different PGE eggs diagnosed in infected goats**

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Infected animal</th>
<th>No.</th>
<th>%</th>
<th>No. of EPG (mean)</th>
<th>Common age of infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemonchus contortus</td>
<td>20</td>
<td>71.43</td>
<td>650</td>
<td>Over 6 months</td>
<td></td>
</tr>
<tr>
<td>Ostertagia spp.</td>
<td>10</td>
<td>35.71</td>
<td>450</td>
<td>Over 35 days</td>
<td></td>
</tr>
<tr>
<td>Trichostrongylus spp.</td>
<td>6</td>
<td>21.43</td>
<td>450</td>
<td>Over 35 days</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28</td>
<td>28</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
Plate (I):
a. E. hirci unsporulated oocyst
b. sporulated
c. E. arloingi unsporulated oocyst
d. sporulated
e. E. intericata unsporulated oocyst
f. sporulated
g. E. ahsata unsporulated oocyst
h. sporulated
i. E. crandalis (sporulated)
j. E. weybriedgegenesis (sporulated)
k. E. christenseni (sporulated)
l. E. marisca (sporulated)
m. E. ovina (sporulated)
n. E. faurei (sporulated)

Plate (II):
a. Haemonchus contortus egg
b. Trichostrongylus sp. egg
c. Ostertagia sp. egg

References


