Diarrhoea in Neonatal baraki kids-goats

Mona S. Zaki[1]; Nagwa S. Ata[2]; Shalaby, S. I[3]. and Iman M. Zytoun[4]

[1]Dept. of Hydrobiology, National Research centre. Cairo, Egypt
[2]Dept. of Microbiology and Immunology, National Research centre. Cairo, Egypt
[3]Dept. of Reproduction, National Research centre. Cairo, Egypt
[4]Dept. of Microbiology, Central Lab. Zagazig University, Zagazig, Egypt
dr_mona_zaki@yahoo.co.uk

Abstract: A survey was carried out in 130 kids-goats aged from 2 days to 3 month from different private farms in El Mounofia and Kalubia Governorates. Out of these animals, 100 were suffering from diarrhoea. Bacteriological examination of the faecal samples revealed the presence of *E. coli* (58%), *Salmonella*, (27%), and *Shigella* (15%), as the main causative agents of diarrhoea. They were sensitive to common antibiotics and less sensitive to 10% garlic extract and 40% *Hibiscaus subdarifa*. Haematological studies revealed significant decrease in hemoglobin content (Hb), erthrocytic (RBCs) count. On contrary, haematocrit value (PCV %) showed significant increase in affected animals. A significant decrease was detected in the values of serum total proteins, albumin, iron, copper, and growth hormone. On the other hand, there was a significant increase in cortisol hormone, lactate dehydrogenase (LDH), and alkaline phosphatase enzymes. We emphasize that the demonstrated diarrhoea caused many harmful clincopathological effects, reduced growth hormone, and caused severe anaemia in kids-goat.
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Introduction

With the increasing application of intensive husbandry methods the various causes of ill-thrift in sheep and goats have attracted increasing attention. The results of many investigations have shown that the greatest loss among these species occurs in the neonatal period (Snodgrass and Angus, 1983). Neonatal diarrhoea in kid-goat is a common problem with not very well understood cause (Snodgrass, et al., 1977). This syndrome has been ascribed to a variety of causes such as nutritional imbalance, faulty management and infectious agents (Durham et al., 1979). Infectious diarrhoea affecting kids-goat occurs mainly where intensive systems of breeding which use paddocks, pens and indoor kids-goat sheds are employed. Such systems unless very carefully managed, encourage the progressive build-up of infection (Allan and John, 1987; Aly, et al., 1996 and Angus, et al., 1982).

Aim of the present work to study the cause of diarrhoea, the clinicopathological changes in blood of infected animals and the suitable antibiotic for treatment.

Material and Methods
Animals:

One hundred and thirty kids-goat (100 diarrhoeic + 30 apparently healthy as a control group), aged from 2days to 3 months were used in this study. These kids-goats belonged to different localities in El-Mounifia and Kalubeia Governorates and under semi-intensive management system.

Sampling:

All animals were sampled once before administration of any treatment.

Bacteriological Studies:
Fecal samples:

Two faecal samples were taken directly from the rectum of all animal in the investigation. One sample was taken in a clean dry plastic packs for parasitological examination to detect gastrointestinal parasites (Coles, 1986) and the second using sterile swabs for further bacteriological analysis. These swabs were immediately inoculated on Carry and Blair's transport medium and were cultured on selective and differential culture media at 37°C for 24 hours and the isolated colonies were then identified according to Carter (1984) sand Baily and Scott (1990) as follows: Isolated colonies from MacConky's agar plate were examined to be either Lactose fermenting or non-lactose fermenting. Lactose fermenting colonies appeared to be rose pink in color and non-lactose fermenting as pale yellow colonies. Isolated colonies were then examined by Gram staining. Colonies, which appeared as Gram negative bacilli were then described for further

identification of Gram negative isolates. These were then subjected to biochemical reactions such as indol production, methyl red Gobes Proskauer test (MR/VP), citrate utilization, hydrogen suiphide production, reaction of triple sugar iron agar (TSI), urease production and oxidase test.

Detection of K99 antigen was performed by slide agglutination test (SAT) according to Baily and Scott (1990), with specific antisera Cryptoporidia were examined in faecal smears on glass slides which were air dried, fixed in methanol and stained with Geimsa stain according to Abou-Zaid and Nasr (1995).

Haematological Studies:

Whole blood samples with EDTA were obtained form the jugular vein for determination of hemoglobin content, haematocrit (PCV%) value, erythrocytic (RBCs) count and total leukocytic (WBCs) count according to Coles (1986).

Biochemical and Hormonal Studies:

Serum samples were used for determination of copper and iron by atomic absorption according to Issac and Kerber (1971). Total proteins, albumin, alkaline phosphatase (ALP), lactate dehydrogenase (LDH) were determined b spectophotomoeter in the rang UV "240 nm". Cortisol hormone was measured according to Kuehn and Burvenich (1986). Growth hormone was measured by special kits according to the method described by Ronge and Blum (1988).

Sensitivity Test:
1. Sensitivity test using common antibiotics:

The following chemotherapeutic agents were used in testing the isolated micro-organisms:

Gentamycin (10mcg/disc), chloramphenicol (30mcg/disc), rifamycine (30mcg/disc), tetracycline (30mcg/disc), ampicillin (10mcg/disc), streptomycin (10mg/disc), nalidixic acid (30 mg/disc), and colistin (10 meg/disc).

2. Sensitivity test using Garlic aqueous solutions:

The isolates were incubated in about 1 0% garlic aqueous solution at 28°C till the colonial broth become evident. The degree of inhibition was compared to control.

3. Sensitivity test using dry *Hibiscus subdarifa* flowers:

The flowers were extracted with 75% ethyl alcohol using apparatus Soxhlet till complete exhaustion occurs. Alcohol was then evaporated to obtain a semisolid extract. Dilutions to 40% were obtained by dissolving the extract in distilled water. The resultant dilutions were used to test microorganisms were streaked with 0.4 mm loop on the extract into the gutter avoiding it over flow on the surface.

Statistical analysis:

All data were subjected to statistical analysis using T- test according to Gad and Well (1967).

Results:

Kids-goat were divided after, careful clinical examination and bacteriological examination of the faecal samples into three groups as shown in Table (1).

Clinical Signs:

Diseased kids-goats showed severe depression unable to stand or move and some of them showed sternal or lateral body recumbent. Soft to watery of faeces tinged with mucus or occult blood or both and having putrefied odour. Varying degree of dehydration and severe losses of skin elasticity. Contaminated skin of anal region, rough hairs, dry muzzle, increase of body temperature, pulse and respiratory rates.

Bacteriological Studies:

Bacteriological examination of the faecal samples of diarrhoeic kids revealed that 100 samples were positive for pathogenic bacteria. The distribution of thee indicated that enteropathogic E. Coil and Salmonella constituted the high incidence while Shigella recorded the very lowerest incidence. The increase in packed cell volume (PCV %) reflected the severity of dehydration occurred in diarrhoeic kids with bacterial enteritis in group 2 (infected with E. coli) and group 3 (infected with Salmonella) than in group 4 (infected with Shigella) and apparently healthy kids (group1). This reflects the severity of diarrhoea caused by enterotoxins produced by enterotoxigenic bacteria proliferation in the intestine which lead to toxaemia and that in turn aggravates the dehydrations. The most characteristic features in diarhoeic kids faeces was watery and contained mucus or occult blood or both and was having putrefied odour could explain the high incidence of isolated enteropathogenic E. coli and Salmonella. However the presence o other pathogenic bacteria was also suggested but their incidence was very low as Shigella

Concerning sensitivity test; the result indicate that E. coli and Salmonnela were highly sensitive to gentamycine, chloramphenicol, rifamycine, and tetracycline, less sensitive to ampicillin and nalidixic acid and resistant to streptomycin and colistine. Moreover, E. coli was

moderately sensitive to *Hibiscous subdarifa* and garlic solution (Table 2).

Results of haematology and biochemistry:

A significant decrease in haemoglobin content (Hb), erythrocytic (RBCs) count while, haematocrit values (PCV%) and the leukocytic (WBCs) count showed significant increase in affected animals with E. coli (group2) and Salmonelh

(group3) than the control healthy animals (group 1) as shown in Table (3).

As shown in Table (4, 5), there were a significant decrease in total proteins, albumin growth hormone, iron, and copper. On the other hand, there was a high level of cortisol hrrnone, lactate dehydrogenase, an alkaline phosphatase in diarrhoeic kids-goat in comparison with the control one.

Table (1): Bacterial examination of faecal samples of diarrhoeic kids-goats

The organism	Number of isolates	% of isolates
E. Coli	58	68.84
Salmonella spp.	27	44.68
Shigellaspp.	15	1.05

Table (2): Results of sensitivity test against different chemotherapeutic agents

Chemotherapeutic agents	Disc concentration	E. coli	Salmonella
Gentamycin	10 mcg	+++	+++
Chlorampheni-col	30 mcg	+++	+++
Rifamycine	30 mcg	+++	+++
Tetracycline	30 mcg	+++	+++
Ampicillin	10 mcg	++	+
Streptomycin	l0mcg	+	+
Naildixic acid	30 mcg	++	+
Garlic aqueous solution 10%	l0%	++	++
Hibiscous extract 40%	40%	++	+
Colistine	10%	+	+

+++ 0.58mm   ++ = 0.38mm   + = 0.23mm

Table (3): Means ± SE of haemoglobin (Hb) haematocrit (PCV%) and erythrocytic (RBCs) count in both healthy and diarrhoeic kids-goat.

Animals groups	Number of animals	PCV%	RBCs (x106/p.i)	Rb (g/dl)
Group I (control)	30	24.25 ± 0.12	10.20± 0.23	9.80± 0.20
Group 2 (E. coli)	58	40.00 ± 0.02 **	8.24± 0.24**	8.00± 0.14**
Group3 (Salmonella)	27	34.00±0.10**	8.10±0.13**	8.23± 0.74**
Group 4 (Shigella)	15	23.24 ± 0.72**	9.42± 0.40	9.03± 0.72

** = Highly significant at P≤ 0.01   SE = Standard error.

Table (4) Means ± SE of iron, copper, cortisol and growth hormones in both healthy and diarrhoeic kids-goat.

Animals groups	Number of animals	Iron (mg/dl)	Copper (mg/dl)	Cortisol (ng/dl)	Grbwth Hormone (ng/dl)
Group 1 (control)	30	250 ± 2.30	185 ± 3.4	0.098 ± 0.73	11.0 ± 0.08
Group 2 (E. coli)	58	178 ± .54**	130 ± 47**	0.130 ± 0.28**	8.0 ± 0.11 **
Group3 (Salmonella)	27	180 ± 3.53**	134 ± 4.0	0.140 ± 0.30**	7.8 ± 0.20**
Group 4 (Shigella)	15	168 ± 4.01**	148 ± 2.0 **	0.150 ± 0.40**	7.1 ± 0.30**

** = Highly significant at P≤ 0.01   SE = Standard error.

Table (5): Means ± SE of total proteins, albumin, lactate Dehydrogenase (LDH). alkaline phosphates (ALP) changes in both healthy and diarrhoeic kids-goat.

Animals groups	Number of animals	Total proteins (g/dl)	Albumin (g/dl)	LDH (U/l)	ALP (U/l)
Group 1 (control)	30	9.3 ± 0.40	4.90 ± 0.27	252 ± 23	15.3 ± 0.80
Group 2 (E. coli)	58	8.2 ± 0.27**	3.80 ± 0.14**	263 ± 31 **	18.7 ± 0.50*
Group3 (Salmonella)	27	7.0±0.10**	3.40± 0.72**	270± 14**	19.1 ± 60 **
Group 4 (Shigella)	15	6.8 ±0.78**	2.86 ± 0.73**	260 ± 26**	19.0 ± 0.54**

 ** = Highly significant at P≤ 0.01   SE = Standard error.

Discussion

Infectious diarrhoea is a common condition affecting kids-goat specially those which are bred under intensive system of breeding in this study. Fecal samples screened the presence of the common enteropathogenic organisms E. Coli, Salmonella species and Shigella which causing diarrhoea. E. Coli seems to be the dominant enteropathogen which plays the major role among diarrhoeic kids goat (Tzipori, et. al., 1981; Angus, et. al., 1982; Carter, 1984; Farid, et. al., 1987 and Rodostits, 1992). Isolation of Salmonella species from diarrhoeic kids-goat confirmed the opinion that Salmonellosis is a sporadic cause of enteritis and cause loss in young kids-goat and buffaloe-calves (Bhullar and Tiawana, 1985). E. Coli and Salmonella were sensitive to garlic 10 %. *Hibiscou.s sabdorifa* flowers 40% sensitive to E. Coli but less sensitive to Salmonella.

The significant decrease in serum total proteins, albumin, iron and copper, in diarrhoeic kids-goat may be referred to the cause of diarrhoea. Where, there was significant increase in bacterial enteritis this could be explained by impaired absorption of these trace elements through the damaged intestinal epithelium resulting from enterotoxins produced by these bacteria in the small intestine (Kasari, 1990 and Aly el. al., 1996). Concerning serum protein and albumin, they showed significant decrease in diarrehoeic kids-goat than the cntrol group. Such drastic reduction may be attributed to diarrhoea, which lower the synthetic power of albumin in the liver due to microorganism. This opinion is supported by finding of Aly, et al. (1996). The significant increase in alkaline phosphatase, lactate dehydrogenase was observed in diarrhoeic kids-goat. Similar results were observed by Sadiek (1987).

A highly significant decrease in serum iron was noticed in diarrhoeic kids-goat, this result agreed with those obtained by Aly, et. al. (1996). The decrease of iron was accompanied by decrease of copper and this lead to anaemia (Radostitis, 1992).

Concerning cortisol hormone, an increase of this hormone can be considered as an expression of stress and helps the organism to counteract this stress, bacmatological, metallic and endocrine changes enhanced protein catabolism and gluconeogenesis during endotoxaemia (Dvorak, et al., 1974). Growth hormone concentrations tended to decrease in diarrhoeic kids-goat. An effect which was probably in part mediated by tumour necrotic factor (Walton and Cronin, 1989).

We can conclude that a substantial, bacteriological haematologlcal, biochemical, and hormonal changes occur in diarrhoeic kids-goat when the cause of diarrhoea is enterotoxigenic bacteria. This means that we must interfere quickly with therapeutic plan to put in consideration the decrease in damaged intestinal epithelium and supporting the body immune status during infection along side with the traditional electrolyte therapy.

Acknowledgment:

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