Results

Our results are presented & illustrated in tables (1-11) & figures (1-14).

Table (1): Demographic characteristics of the studied patients (N^o = 50):

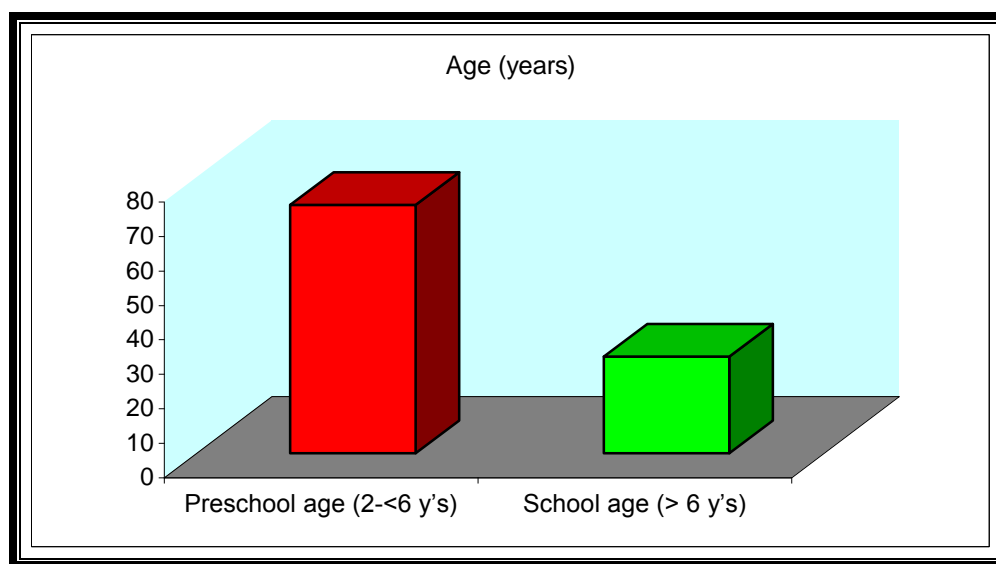| Variables	N^o.	%	Z	P value
Age (years):				
• Preschool age (2-6 y's)	36	72%	3.11	**<0.001**
• School age (> 6 y's)	14	28%		
Sex:				
• Males	28	56%	0.85	>0.05
• Females	22	44%		
Residence:				
• Rural	34	68%	2.55	**<0.05**
• Urban	16	32%		

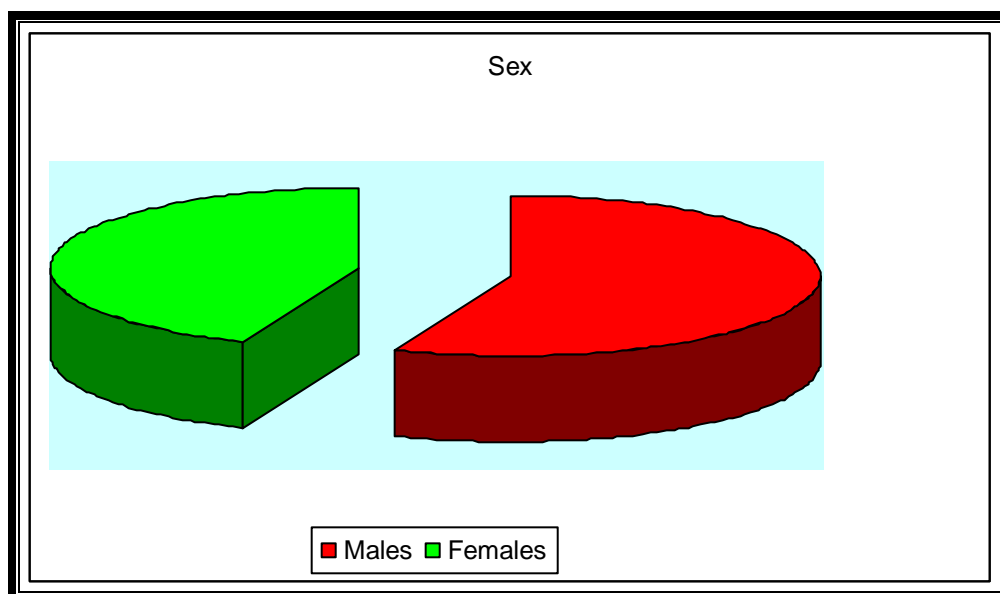**Figure (1): Age distribution of the studied group.**

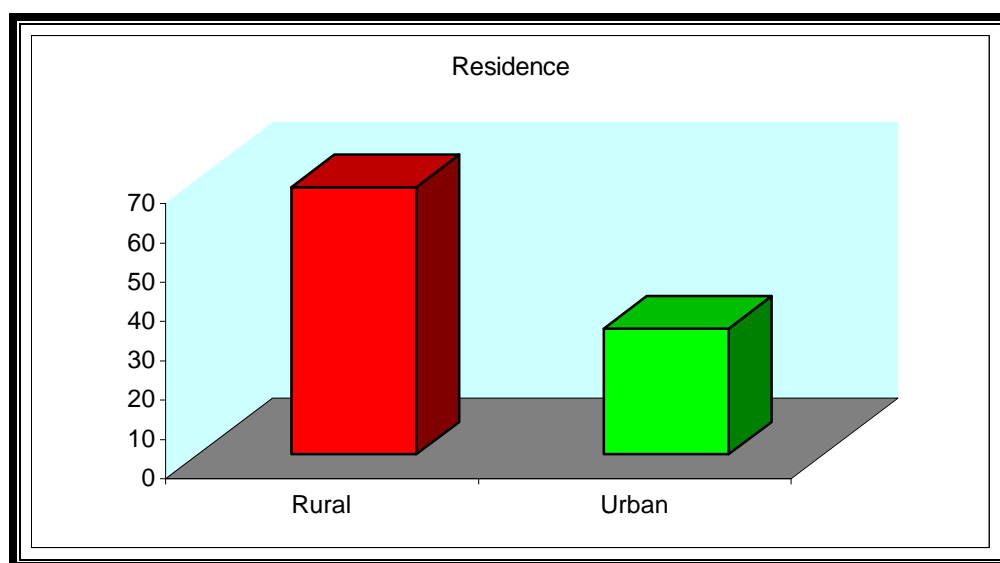**Figure (2): Sex distribution of the studied group.**

Figure (3): Residence of the studied group.

Table (1) and figures (1-3) show that acute diarrhea is significantly commoner among preschool children (2-6 y's) than among school children (>6 y's). Also, it is significantly commoner in the rural areas than in the urban ones. No significant gender predilection was detected.

Table (2): Clinical presentations in the studied patients (No = 50):

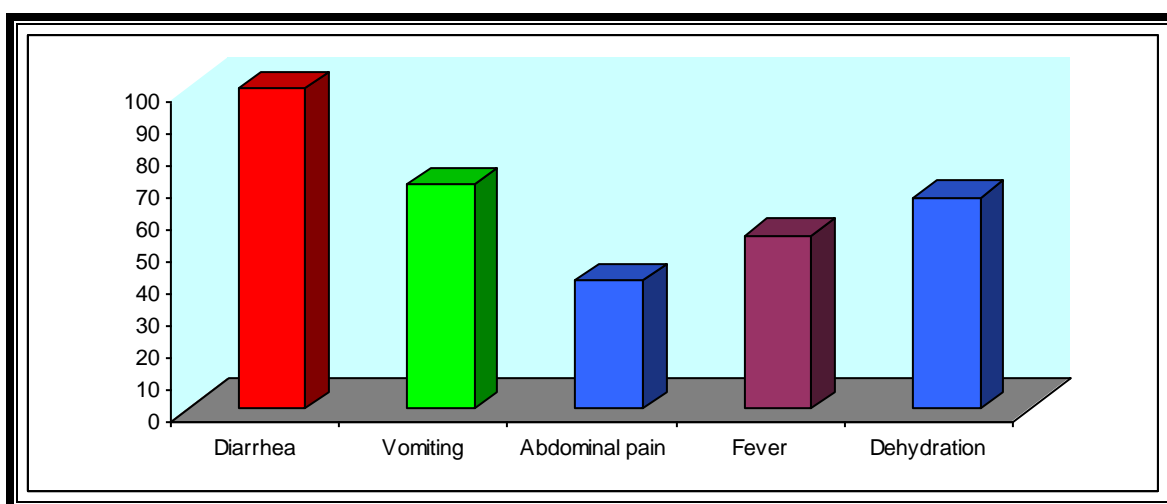| *Clinical presentation*	N$^{\underline{o}}$	%
Diarrhea	50	100 %
Vomiting	35	70%
Abdominal pain	20	40%
Fever	27	54%
Dehydration	28	66%

Figure (4): Clinical presentations in the studied patients.

Table (2) and figure (4) show that acute diarrhea is commonly accompanied by vomiting (70%), dehydration (66%), fever (54%) and/or abdominal pain (40%).

Table (3): Frequency of enteric pathogens in the studied group.

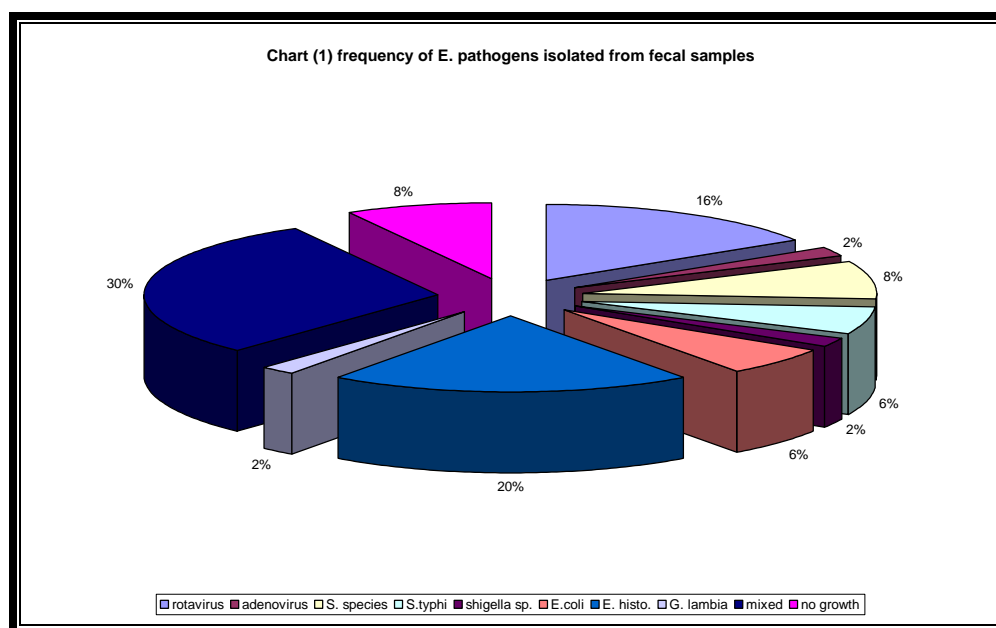|		N^O	Percentage
Viral (18%)	**Rota virus**	8	16%
	Adeno virus	1	2%
Bacterial (22%)	**Salmonella typhi**	3	6%
	Other Salmonella species	4	8%
	Shigella species	1	2%
	E. Coli	3	6%
Parasitic (22%)	**Entameba histolytica**	10	20%
	Giardia lambilia	1	2%
Mixed infection (30%)		15	30%
Undetected (8%)		4	8%
Total		50	100%

Figure (5): Frequency of enteric pathogens in the studied group.

Table (3) and figure (5) show that acute diarrhea is most commonly due to mixed infection, (30%), less commonly bacterial (22%) or parasitic (22%) in etiology and least commonly due to viral infection (18%). The cause could not be detected in 8% of our patients.

The most frequently isolated organisms were Entameba histolytica (20%), followed by Rota virus (16%), then Salmonella species (14%) and E.coli (6%). The least frequently isolated organisms were Giardia lamblia, Adeno virus and Shigella species (2% each).

Table (4): Type of infection according to age group.

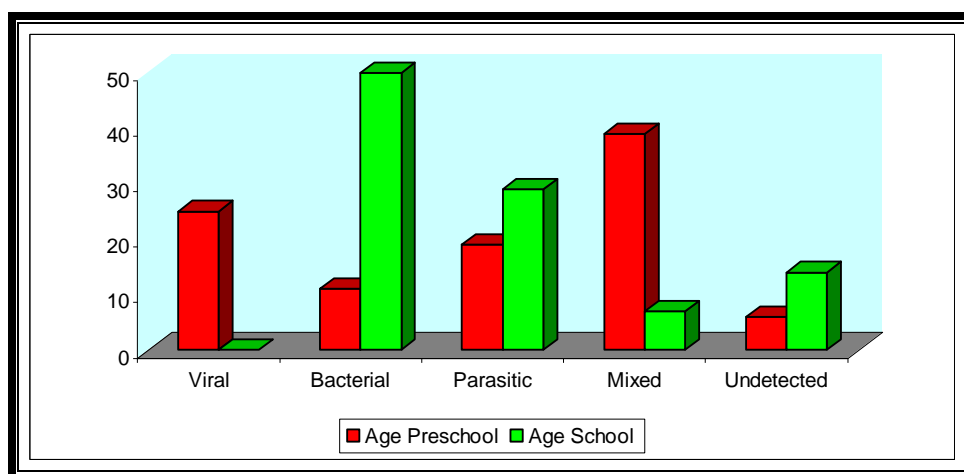|		Viral		Bacterial		Parasitic		Mixed		Undetected		Total	
		Nº	%	Nº	%	Nº	%	Nº	%	Nº	%	Nº	%
Age	Preschool	9	25%	4	11.2%	7	19.4%	14	38.8%	2	5.6%	36	100%
	School	0	0%	7	50%	4	28.6%	1	7.2%	2	14.3%	14	100%
Z		4.14		8.88		1.26		4.37		3.68		19.36	
P value		<0.05		<0.05		>0.05		<0.05		>0.05		<0.001	

Figure (6): Type of infection according to age group.

Table (4) and figure (6) show that in preschool children, acute diarrhea was most commonly due to mixed infection (38.8%) followed by viral infection (25%), parasitism (19.4%) and bacterial infection (11.2%). In school children, acute diarrhea was most commonly due to bacterial infection (50%) followed by parasitic infestation (28.6%) and mixed infection (7.2). No viruses were detected and the pathogen could not be identified in 14.3% of these children. Viral and mixed infections were significantly commoner in preschool children than in school children while bacterial infection was significantly more predominant in school children. Parasitism showed no significant age predilection.

Table (5): Types of organisms according to age group.

|		Preschool age $N^{\underline{o}} = 36$		School age $N^{\underline{o}} = 14$		Z	P
		No	%	No	%		
Viral	**Rota virus**	8	22.2%	0	0%	1.98	>0.05
	Adeno virus	1	2.8%	0	0%	4.636	<0.05
Bacterial	**Salmonella typhi**	0	0%	3	21.4%	5.639	<0.05
	Other Salmonella species	2	5.6%	2	14.3%	3.68	<0.05
	Shigella species	1	2.8%	0	0%	4.636	<0.05
	E. coli	1	2.8%	2	14.3%	6.01	<0.05
Parasitic	**Entameba histolytica**	6	16.6%	4	2 8.5%	5.38	>0.05
	Giardi lambilia	1	2.8%	0	0%	4.636	<0.05
Mixed		14	38.8%	1	7.2%	1.26	>0.05
Undetected		2	5.6%	2	14.3%	3.68	>0.05
Total		36	100%	14	100%	19.36	<0.001
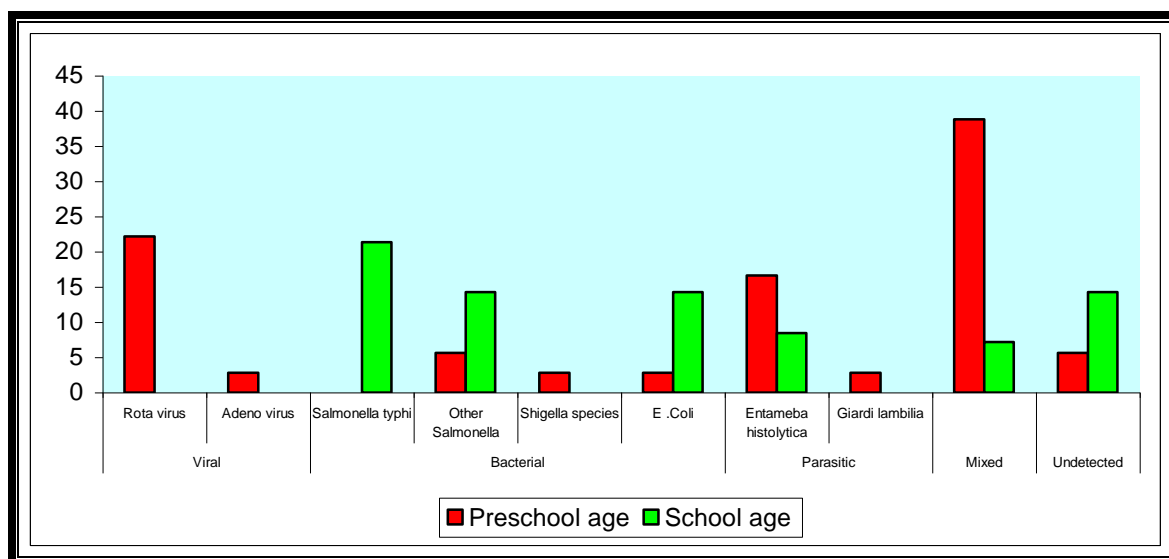
Figure (7): Types of organisms according to age group

Table (5) and figure (7) show that the most frequently isolated organism among our preschool children was Rota virus (22.2% of patients) followed by Entameba histolytica (16.6%) then salmonella (5.6%) and lastly Shigella, E.coli, Adenovirus and Giardia lamblia in the same percentages of 2.8% of the patients. Among our school children, the most frequently isolated organisms were Entameba histolytica then Salmonella typhi in percentages of 28.5% and 21.4% respectively followed by other Salmonella species and E.coli in the same percentage of 14.3% of cases.

Table (6): Type of infection according to sex.

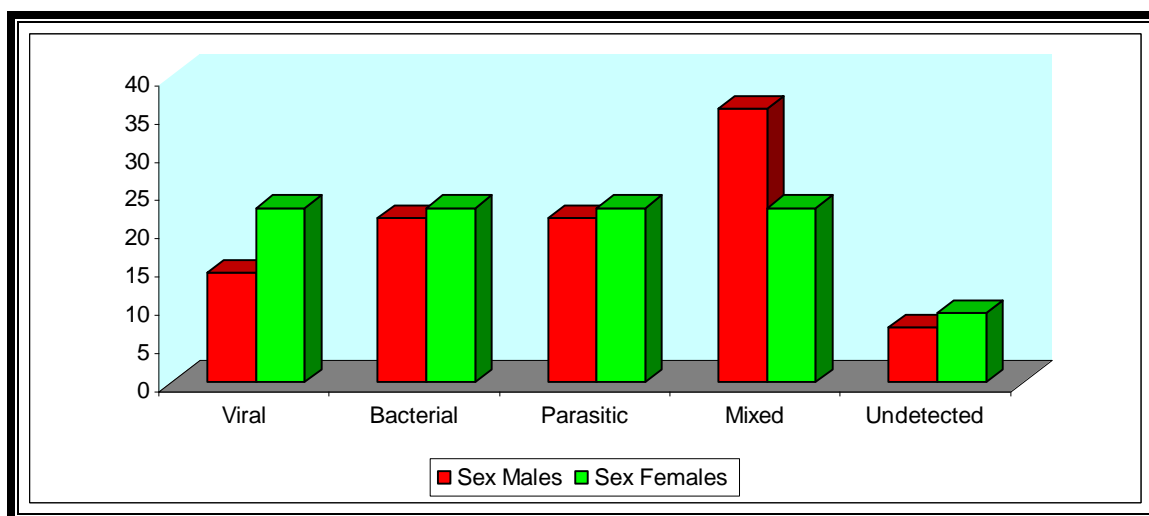|		Viral N=9		Bacterial N=11		Parasitic N=11		Mixed N=15		Undetected N=4		Total	
		No	%	No	%	No	%	No	%	No	%	No	%
Sex	Males	4	14.3%	6	21.4%	6	21.4%	10	35.7%	2	7.2%	28	100%
	Females	5	22.75%	5	22.75%	5	22.75%	5	22.75%	2	9%	22	100%
Z		0.221		0.181		0.181		3.332		0.933		1.44	
p		>0.05		>0.05		>0.05		>0.05		>0.05		>0.05	

Figure (8): Type of infection according to sex.

Table (6) and figure (8) show no significant sex predilection in any of the types of infection. In males, the commonest cause of acute diarrhea was mixed infection (35.7% of patients) followed by bacterial and parasitic infections (21.4% each) then viral infection (14.3%). However, in females, all the types of infection showed the same frequency of occurrence (22.75%).

Table (7): Type of infection according to residence

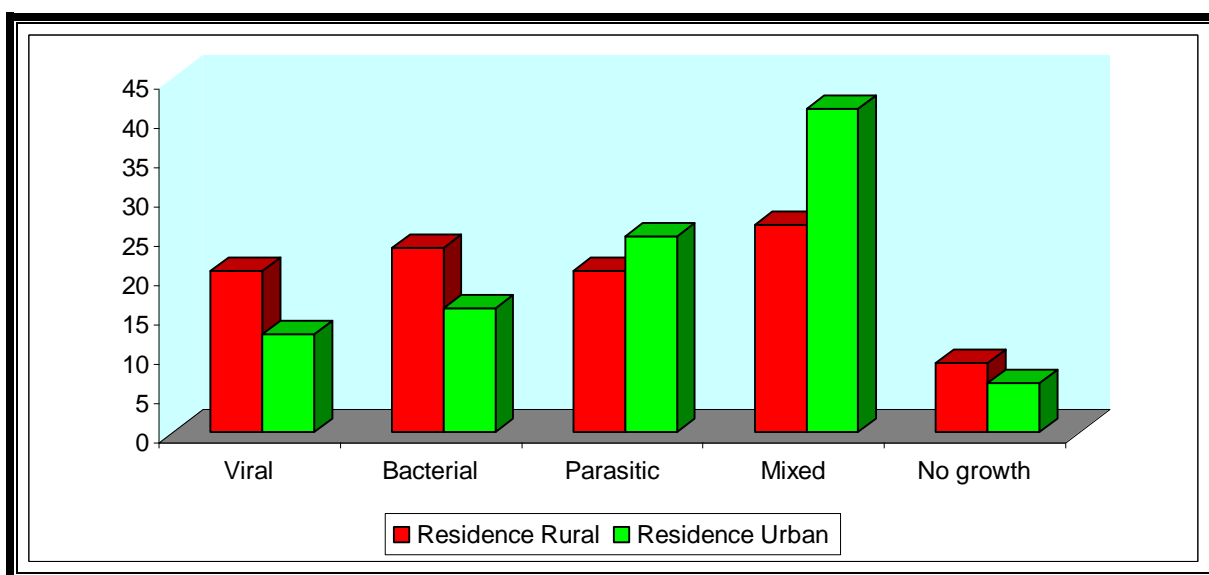|		Viral No = 9		Bacterial No = 11		Parasitic No = 11		Mixed No = 15		No growth No = 4		Total	
		No	%	No	%	No	%	No	%	No	%	No	%
Residence	Rural	7	20.59%	8	23.53%	7	20.59%	9	26.47%	3	8.82%	34	100%
	Urban	2	12.5%	3	18.75%	4	25%	6	37.5%	1	6.25%	16	100%
Z		5.562		4.55		1.64		1.20		2.00		12.96	
P		<0.05		<0.05		>0.05		>0.05		>0.05		<0.05	

Figure (9): Type of infection according to residence.

Table (7) and figure (9) show that the most frequent type of infection in the rural areas were mixed then bacterial infections (26.47% and 23.53% of cases respectively) followed by parasitic and viral infections in the same percentage of 20.6%. In the urban areas, the most frequent type of infection was mixed then parasitic infections (37.5% and 25% respectively) followed by bacterial and viral infection (18.75% and 12.5% respectively). Both viral and bacterial infections were significantly commoner in the rural areas than in the urban ones.

Table (8): Type of organism according to residence.

|		Rural No = 34		Urban No = 16		Z	P
		No	%	No	%		
Viral	Rota virus	7	21%	1	6.25%	1.66	>0.05
	Adeno virus	0	0%	1	6.25%	2.11	>0.05
Bacterial	Salmonella typhi	1	3%	2	12.5%	0.176	>0.05
	Other Salmonella	3	8.8%	1	6.25%	0.101	>0.05
	Shigella species	1	3%	0	0%	0.480	>0.05
	E .Coli	3	8.8%	0	0%	1.20	>0.05
Parasitic	Entameba histolytica	6	17.6%	4	25%	0.370	>0.05
	Giardia lambilia	1	3%	0	0%	0.480	>0.05
Mixed		9	26%	6	37.5%	0.730	>0.05
Undetected		3	8.8%	1	6.25%	0.101	>0.05
Total		34	100%	16	100%	12.96	<0.05
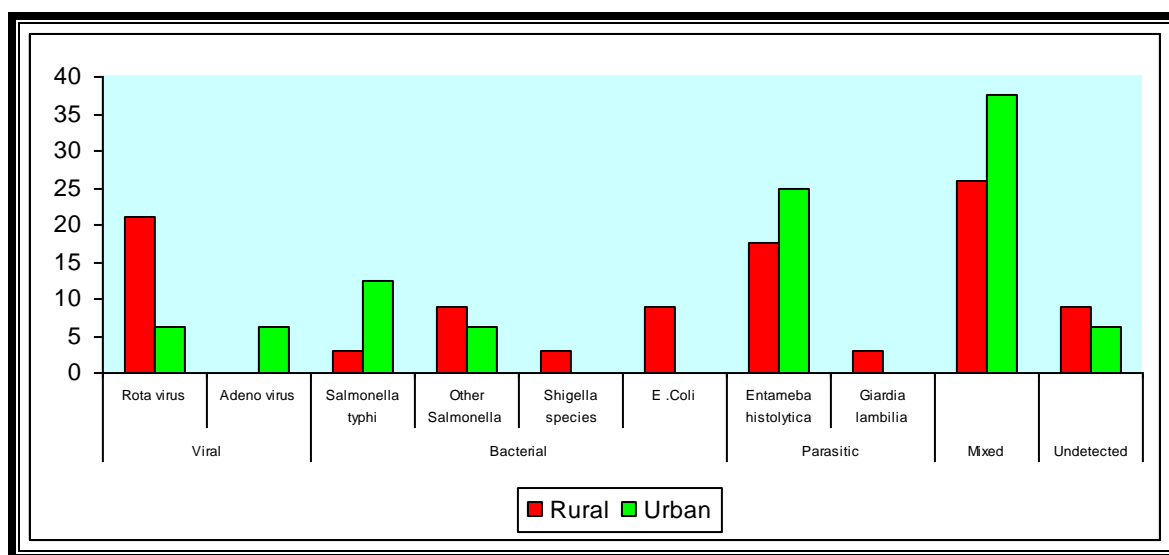
Figure (10): Type of organism according to residence.

Table (8) and figure (10) show that although acute diarrhea is significantly commoner in the rural areas than in the urban areas, none of the isolated organisms had significant predilection to any of them. In the rural areas, after

mixed infection (26% of cases), the most commonly isolated pathogen was Rota virus (21%), followed by Entameba histolytica, (17.6%) then E.coli and other Salmonella species (8.8% each) and lastly Salmonella typhi, Shigella and Giardia lamblia (3% each). In the urban areas, after mixed infection (37.5%), the most commonly isolated pathogen was Entameba histolytica (25%) followed by Salmonella typhi (12.5%) then Rota virus, Adeno virus and the other Salmonella species (6.25% each).

Table (9): Clinical manifestations in the different types of acute diarrhea.

	Viral No=9		Bacterial No=11		Parasitic No=11		Mixed No=15		Undetected No=4		X^2	p. value
	No	%	No	%	No	%	No	%	No	%		
Vomiting	5	55.6%	8	72.7%	8	72.7%	12	80%	2	50%	1.336	>0.05
Abdominal pain	1	11.2%	5	45.5%	6	54.5%	6	40%	2	50%	2.963	<0.05
Fever (>38 Cº)	4	44.4%	9	81.8%	5	45.5%	8	53.3%	1	25%	0.659	>0.05
Dehydration	8	88.8%	2	18.2%	5	45.5%	12	80%	1	25%	0.428	>0.05
Frequency of diarrhea (per day) (Mean ± SD)	7.6 ± 1.7		6.6 ± 1.4		6.2 ± 1.8		6.9 ± 2.1		6.5 ± 1.7		F = 0.81	>0.05

Table (10): Stool characters in the different types of acute diarrhea.

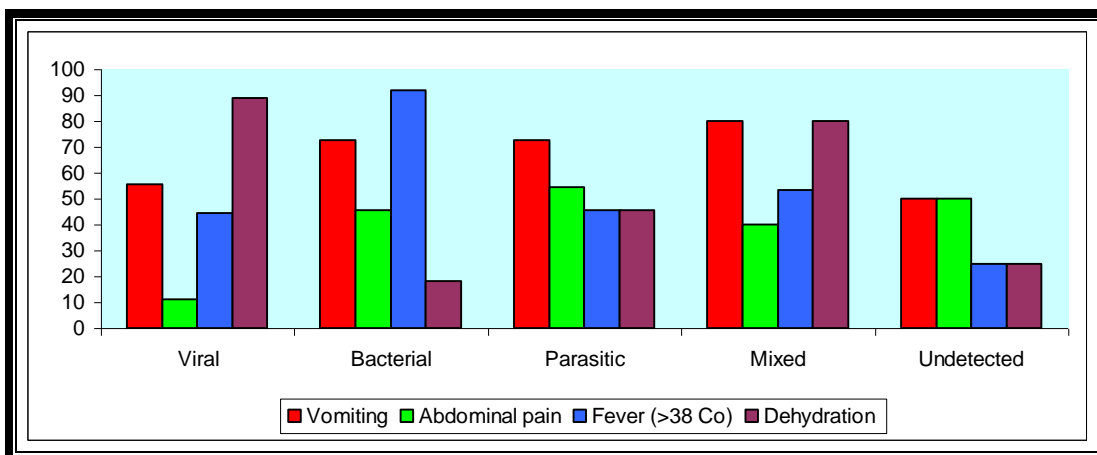|	Viral No=9		Bacterial No=11		Parasitic No=11		Mixed No=15		Undetected No=4		Total N=50		X^2	p. value
	No	%	No	%	No	%	No	%	No	%	No	%		
Offensive	4	44.4%	9	81.8%	9	81.8%	7	46.7%	3	75%	32	64%	1.253	>0.05
Watery	6	66.7%	6	54.5%	5	45.5%	9	60%	3	75%	29	58%	0.639	>0.05
Blood & mucous	0	0%	4	36.4%	5	45.5%	3	20%	0	0%	12	24%	1.582	>0.05

Figure (11): Clinical manifestations in the different types of acute diarrhea.
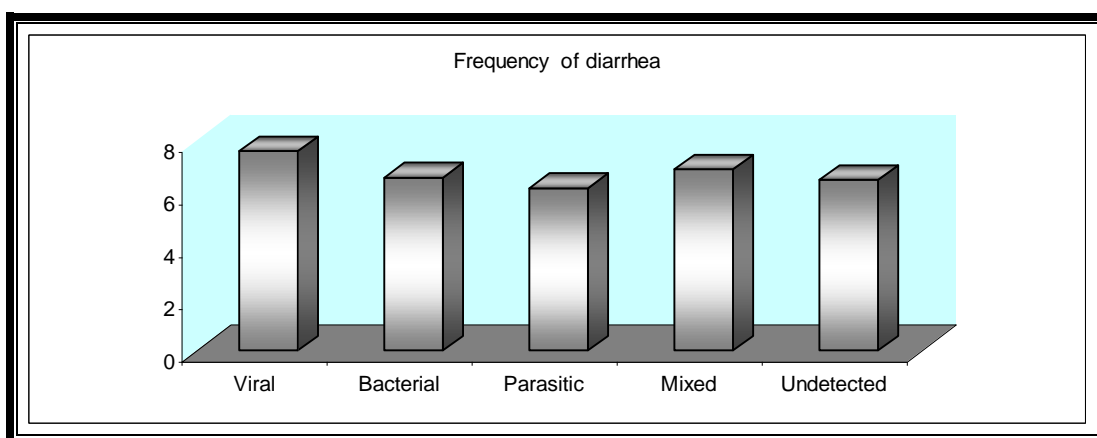

Figure (12): frequency of diarrhea in the different types of acute diarrhea.
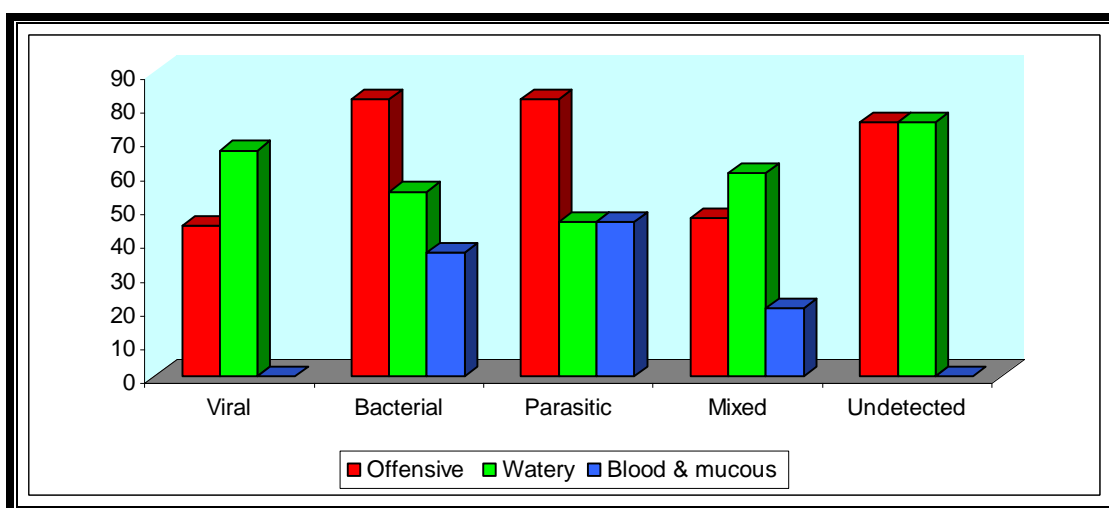

Figure (13): Stool characters in the different types of acute diarrhea.

From tables (9 & 10) as well as figures (11, 12 & 13) we can see that abdominal pain is least frequent in viral diarrhea when compared with the other types of infection. Otherwise, the frequencies of the other associated presentations as well as the stool characters showed no statistical significant differences among the different types of infection.

Table (11): Laboratory findings in the different types of acute diarrhea.

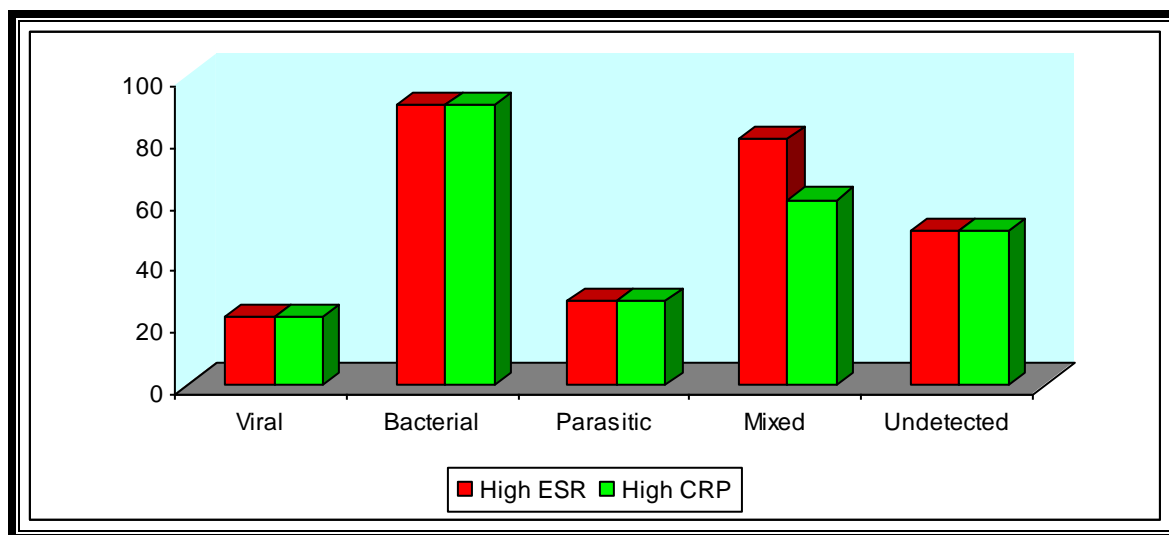|	Viral No=9		Bacterial No=11		Parasitic No=11		Mixed No=15		Undetected No=4		Total N=50		X^2	p. value
	No	%	No	%	No	%	No	%	No	%	No	%		
High ESR	2	22.2%	10	90.9%	3	27.3%	12	80%	2	50%	37	74%	2.935	<0.05
High CRP	2	22.2%	10	90.9%	3	27.3%	9	60%	2	50%	26	52%	2.663	<0.05

Figure (14): Laboratory findings in the different types of acute diarrhea.

Table (11) and figure (14) show that ESR and CRP were significantly higher in bacterial gastroenteritis (90%) than in the other types of acute diarrhea.