

Investigation of epidemiological characteristics and outcomes in Enteropathogenic *Escherichia coli*-positive patients



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Introduction

- New generation multiplex polymerase chain reaction (PCR) panels have led to the ability of rapid detection of Enteropathogenic *Escherichia coli* (EPEC).
- Many studies have looked at the pathogenesis of this organism in the pediatric populations, primarily associated with infant diarrhea in developing countries and fewer studies have included adults.
- We aimed to determine if EPEC is pathogenic on its own, or has a predilection for certain populations based upon risk factors, by comparing risk factors in patients positive for EPEC on the BioFire Gastrointestinal (GI) Pathogen Panel versus patients negative for all targets on the panel.

Methods

- This a single center case control study that was performed using a retrospective chart review from January 1st, 2016 thru August 31st, 2019.
- All patients were symptomatic with diarrheal illness and had a GI pathogen panel performed.
- The study group were patients that were EPEC positive.
- The control group were patients with a negative PCR panel that were matched three to one based upon age and gender.
- The data was extracted using ICD9 and ICD10 codes for the past medical history. Fisher Exact Test and T tests was used to compute the p values based upon the variables.

Results

Table 1

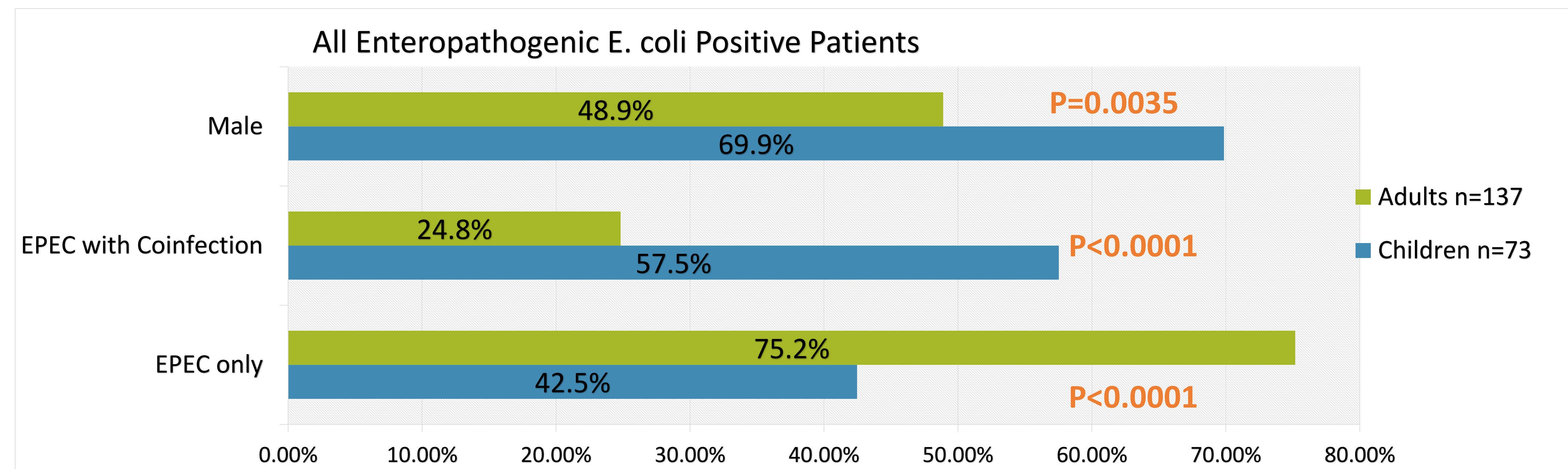


Table 2

Adults Data Ages 18 year and older		
	EPEC positive patients N=137	Control N=402
Total Adult N=539		
Average Age	54.8	54.8
Past medical History all in (%)		
Coronary Artery Disease	34.8	43.0
Diabetes Mellitus	36.8	46.5
Chronic Kidney Disease	38.0	41.0
Autoimmune Disease**	31.4	19.2
S/P Transplant	13.1	16.2
Underlying diagnosis of chronic diarrhea++	61.3	62.2
Duration of stay (days)		
Actual length of stay	13.5 CI 95%[4.6,22.2]	9.3 CI 95%[7.9,10.5]
Expected length of stay	5.5 CI 95%[4.4,6.6]	5.2 CI 95%[4.7,5.7]
**P<0.05 and statically significant ++Includes Irritable bowel disease, Crohns, Ulcerative colitis, Celiac disease, Lactulose intolerance, Chronic pancreatitis and Unspecified causes of diarrhea.		

Table 3

Children Data Less than 18 years of age		
	EPEC positive patients N=73	Control N=180
Total Children N=253		
Average Age	4.9	6.2
Past medical History all in (%)		
Pediatric coronary artery disease	0.0	6.7
Diabetes Mellitus	4.1	4.4
Chronic Kidney Disease	6.9	9.4
Autoimmune Disease	17.8	13.9
S/P Transplant	9.6	16.1
Underlying diagnosis of chronic diarrhea ++	45.2	45.0
Duration of stay (days)		
Actual length of stay**	12.7 CI 95%[4.1,12.3]	25.8 CI 95%[17.8,33.8]
Expected length of stay**	4.7 CI 95%[3.0,6.4]	11.9 CI 95%[5.1,18.7]
**P<0.05 and statically significant ++Includes Irritable bowel disease, Crohns, Ulcerative colitis, Celiac disease, Lactulose intolerance, Chronic pancreatitis and Unspecified causes of diarrhea.		

Discussion/Conclusion

- In comparing the children, expected length of stay (LOS) was at baseline longer in the control group and this was statically significant along with the actual length of stay. This makes it difficult to interpret the differences in the LOS
- In the adult group there were more patients that had an underlying autoimmune disease and upon further subgroup analyses there was more autoimmune hepatitis seen.
- It has been suggested that pathogenic *E. coli* involves the same pathway as various autoimmune diseases
- The adult EPEC positive patients displayed no statistically significant difference in length of stay in comparison to negative control.
- This raises the question to if this is truly a pathogen in adults and may need further studies to determine pathogenicity.

Selected References

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Acknowledgments

