Objectives: The aim of the study was to investigate and correlate basic laboratory and epidemiological findings of patients with acute gastroenteritis (GE) with the specific causative agent. Methods: 297 feces specimens retrospectively selected to be positive for one causative agent of acute GE were obtained from 153 female and 144 male children (age range: 0-14) who were admitted to hospital as sporadic cases of GE, during one year in Thessaloniki. All specimens were cultivated with classical laboratory methods. The presence of Rotavirus was investigated by ELISA whereas Norovirus both by ELISA and RT-PCR. Data included sex, age, presence of granulocytes in feces, electrolytes serum levels, blood count, erythrocyte sedimentation rate, CRP, seasonal distribution and distribution of the population in rural and urban areas. Statistical analysis was performed by SPSS 17. Results: Among the 297 causative agents, Salmonella accounted for 41.8% (124/297), Rotavirus 35% (104/297), Norovirus 14.1% (42/297), Campylobacter 7.4% (22/297) and Yersinia 1.7% (5/297). Total number of lymphocytes (TNL) and monocytes (TNM) were statistically significant higher in viral GE than in the bacterial GE (TNL: 3023.98 vs 1893.19, p=0.0005, TNM: 1089.85 vs 925.92, p=0.03). CRP serum levels were statistically significant higher in bacterial than in viral GE (CRP: 8.85 vs 3.76, p=0.0005). The presence of granulocytes in feces was more often in bacterial GE (p=0.0005). When each causative agent was studied individually it was found that total number of white blood cells were statistically significant higher in Salmonella group (p=0.03) and statistically significant lower in Rotavirus group (p=0.001), while TNL and TNM were statistically significant higher in Rotavirus group (p=0.001). The absence of granulocytes in feces in combination with increased total number of monocytes yielded 83.74% positive predictive value and 78.26% negative predictive value for the diagnosis of a viral GE. Electrolytes disorders were more frequent in children infected by Salmonella (p=0.05). The seasonal distribution revealed that there were higher detection rates (72/104) of Rotavirus during winter (December to March) and higher isolation rates (89/124) of Salmonella during summer (June to October). Conclusions: Blood count, the presence of granulocytes in feces, CRP and the seasonal distribution can contribute to the discrimination of viral from bacterial GE.