

Isolation and Identification of *Shigella dysenteriae* from patients in Najaf Province / Iraq

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ABSTRACT:

A total of 120 stool samples were collected from children suffering from watery diarrhea with blood, less than 10 years old of both genders whom admitted to the Alzahraa Obstetrics Hospital in Najaf Province, at the period of January 2017 to December 2017, in order to evaluate the routine laboratory diagnostic procedures in the diagnosis of *Shigella dysenteriae*. For phenotypic characterization, *Shigella dysenteriae* has been isolated and identified by using culturing method in addition to biochemical tests. Depending on the rate of *Shigella dysenteriae* isolation in different age groups, the results revealed that some infections were recorded in children samples below 1 year of age in this study and the highest percent (49%) were at 1-4 years of age and there was no significant difference ($p > 0.01$) between the rate of isolation and age of children. On the other hand, the highest rate of isolation was in rural area (55%) while in urban area was (45%) and there was a significant difference ($p < 0.01$) between the rate of isolation and residence of children. This study also showed that the higher rate of *Shigella dysenteriae* isolation from stool samples were in November (84.6%) followed by (15.4%) in October then the infection disappear in the followed months (April-September) while other isolates distributed in identical percent (15%) for December, January (7%) and February (3%).

KEYWORDS: *Shigella dysenteriae*, Isolation, Identification, Iraq.

INTRODUCTION

The genus *Shigella* is composed of non-motile gram-negative bacteria in the family Enterobacteriaceae. There are four subgroups that have been historically treated as separate species, although recent genetic analysis indicates that they are members of the same species. These include subgroup A (*Shigella dysenteriae*), subgroup B (*S. flexneri*), subgroup C (*S. boydii*), and subgroup D (*S. sonnei*). Bacteria are considered highly infectious, as infection can result from ingestion of 10-200 organisms. 2

However, in rare cases, *S. dysenteriae* can be associated with the systemic illness hemolytic uremic syndrome (HUS). ONLY *S. dysenteriae* is associated with this illness, as it is the only *Shigella* species that makes Shiga toxin. Typically occurring in children, this is a potentially fatal illness in which patients can develop damage of the small blood vessels in target organs, typically the kidney and brain, leading to renal failure or stroke. There is no specific therapy to prevent this complication, and patients receive supportive care. Although this is an infrequent event after *S. dysenteriae* infection, in less than 10% of patients who develop it, it can be fatal. If not fatal, patients can develop permanent renal failure or renal damage, or have neurologic complications. Early administration of antibiotics in cases of *S. dysenteriae* diarrhea is associated with a low risk of HUS.

MATERIALS AND METHODS

Isolation and Identification of *Shigella dysenteriae*:

A total of 120 clinical specimens from stool from patients in Najaf Province hospitals more than one year time 2017. Isolates were recovered from clinical specimens after culturing on MacConkey agar, S.S. agar and incubated for overnight at 37°C, lactose non fermenting bacteria were sub-cultured and incubated for extra overnight. Suspected bacterial isolates which their cells are Gram negative bacteria and negative to oxidase .

RESULTS AND DISCUSSION

Isolation and Identification of *Shigella. dysenteriae*: The isolation of *S. dysenteriae* from Patients According to:

□ The age

The distribution of *S. dysenteriae* according to age of the patients as noted in (fig.1), No infection were recorded in children samples below 1 year of age in this study which may be due to the immunity conferred by breast feeding. Breast feeding is associated with a substantial decrease of the risk of severe shigella infection (Qureshi et al., 2006) or might be due to the boiled drinking water usually given to infant (WHO, 2001). The highest percent (49%) were at 1-4 years of age, because of low health consciousness and poor personal hygiene at this age. The results obtained were statistically non-significant ($p > 0.01$).

This result was also noted in India, which is an endemic area (Uppal et al., 1999). The lowest percent in elder patient may be due to the acquired immunity gained from repeated exposure to the disease, whether clinical or asymptomatic infection (Deb et al., 1979). This result was dissimilar with (Basim, 2008) when found the percentage of the disease was 16.3% in <1 year of age. While Al-Abbassi et al. (2005) found the highest incidence of clinical Shigellosis is usually observed among toddlers, pre-school children. Shigellosis can affect people of any age, including teens. It's especially common in children ages 2 to 3 years old because they're often not toilet trained yet or they don't wash their hands after using the bathroom. That's one of the reasons why it's important to wash your hands after using the restroom. It takes as few as 10 of these bacteria to cause an infection. That means that *Shigella* bacteria can spread easily within families, schools, child-care centers, nursing homes, and other institutions. (Piya ,2000).

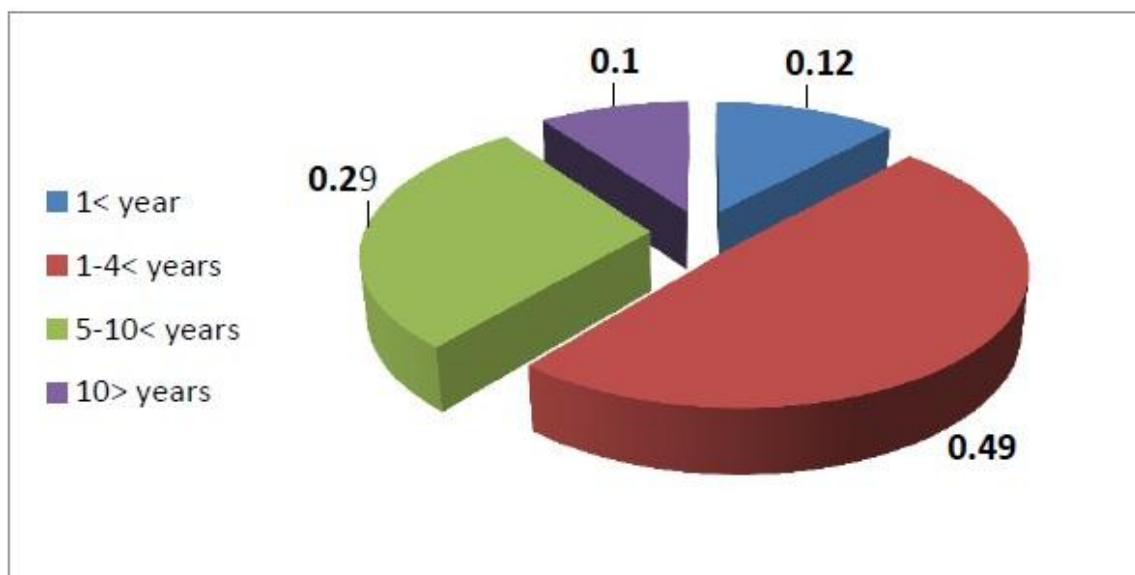


Figure (1): T distribution Shigellosis according to age of children.

□ The gender

We found that the results of isolation of *S. dysenteriae* were statistically significant ($p < 0.01$) as demonstrated in the (fig.8, app.3) depending on the gender of patient. The percent of the Shigellosis in females were 60% while in males were 40%. This indicates that female is more susceptible than male to infection. Shakya (1999); Piya (2000) found that the highest percent of the Shigellosis is in male patients. Basim (2008) found that the percent of the Shigellosis was (54.4%) in male patients while (45.6%) in female patients. On the other hand Mathur *et al.*(2003) and Al-Abbassi *et al.*(2005) found that there was no effect of gender on the shigella infection.

Any differences between males and females in disease progression appear to be related to gender norms rather than to biology. Clues from social epidemiology point to women's increased contact with infectious doses of cholera as well as that traditional gender dynamics tend to disadvantage women and girls due to less decision-making authority within the household and less access to resources such as transportation for life- saving medical care or potable water, particularly for female. headed households who tend to be even more disadvantaged . 4

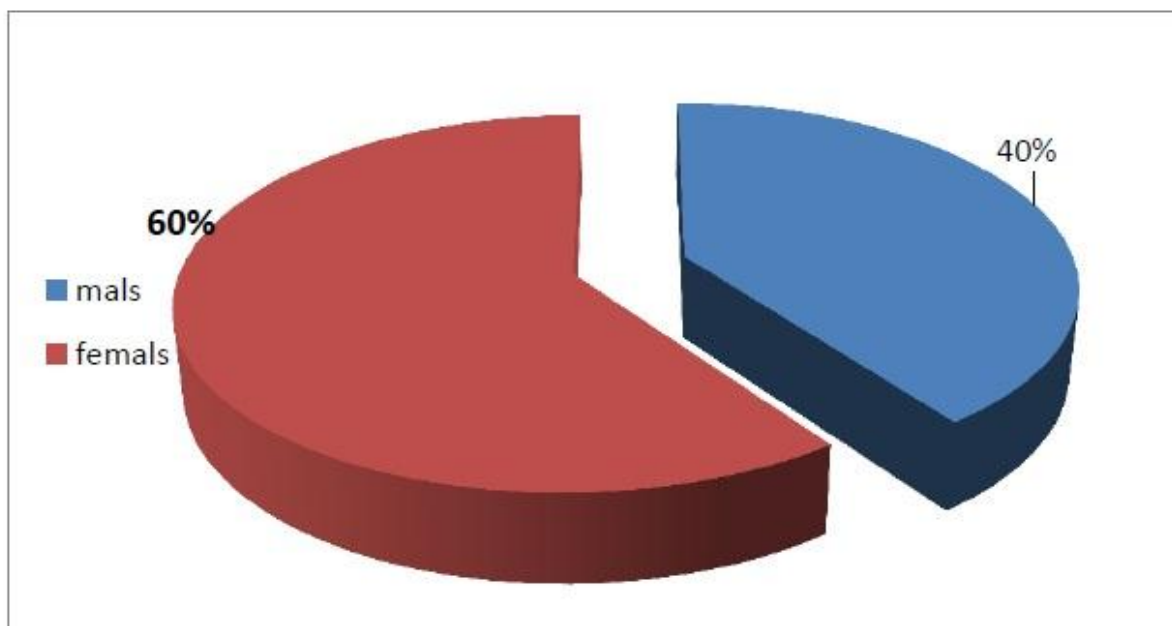


Figure (2): The distribution of Shigellosis infection according to gender of children.

□ The residence

We found that the result of isolation of *S. dysenteriae* was statistically significant ($p < 0.01$) as demonstrated in the (fig.9, app.4) depending on the residence of patient. The percent of the Shigellosis in rural was 55% while in urban residence was 45%. Chander *et al.* (2009) found the infection rate was higher in suburban area with poor sanitation. Basim (2008) discussed the spread of infection in different area of Iraq and he was attributed it to poor sanitation and poor water supply. In fact, poor sanitary conditions, overcrowding, with a majority of the people living below the poverty line, lack of proper sewage disposal system and improper water supply may play an important role in the occurrence of infection in these areas (Rafi *et al.*, 2004).

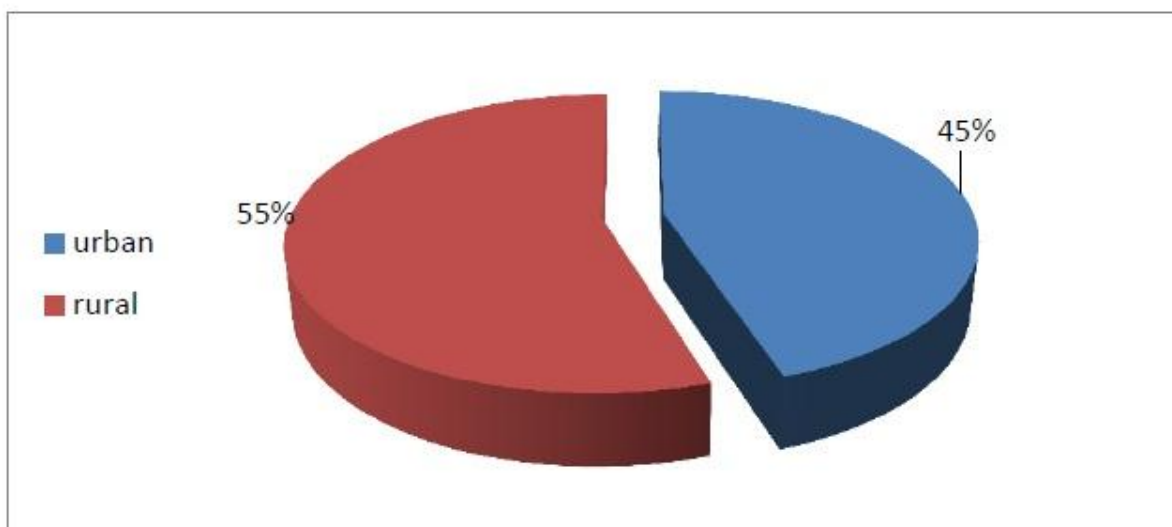


Figure (3): The distribution of Shigellosis according to residence of children. 5

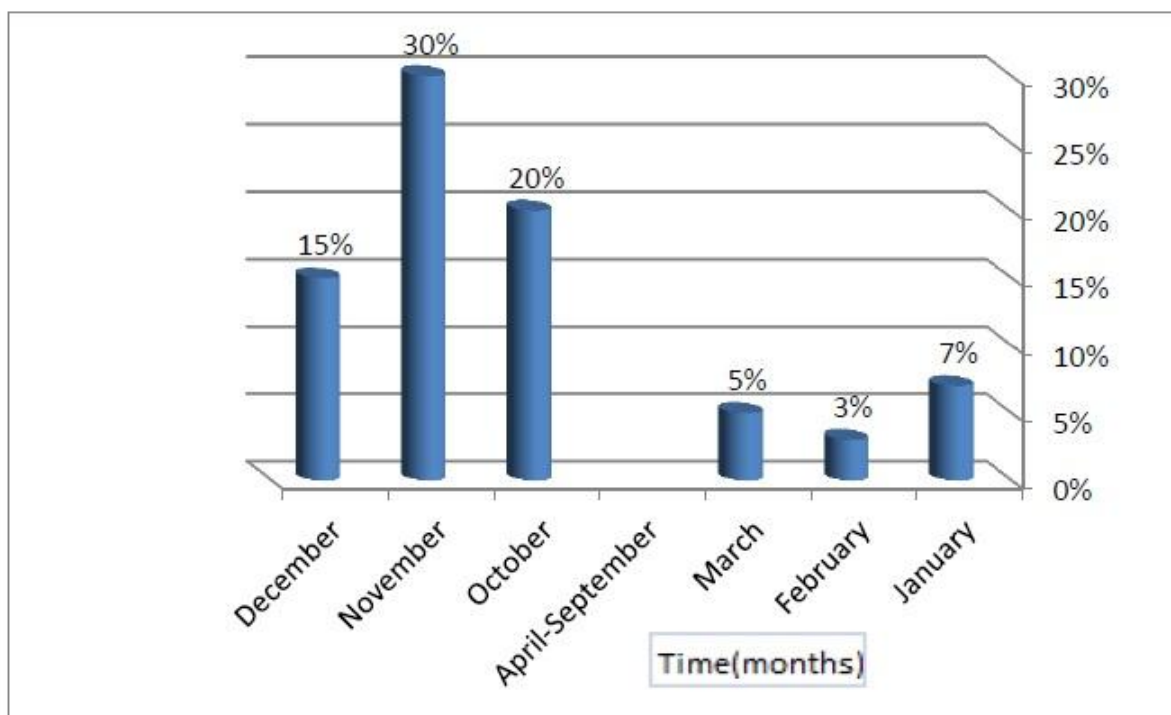


Figure (4): The distribution of Shigellosis according to months of year

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