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Serological Diagnosis of Typhoid and Dengue Fever in Pyrexia Cases Attending Tertiary Care Hospital In Hyderabad

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Abstract:
Background*:Acute and subacute febrile illness is a common clinical syndrome among patientsseeking hospital care in India, in whichduration of fever lasts up to 14 days.Developing nations share the highest burdenof diseases like dengue and typhoid fever.Symptoms of these diseases may mimic otherdiseases like chikungunya, malaria, makingaccurate clinical diagnosis and treatmentdifficult without laboratory confirmation.*
Materials and Methods*: 401 Blood specimens from patientsattending the tertiary care centre withcomplaints of fever were tested withDengue NS1 Ag and IgM ELISA kit andwith commercially available widal test kitwith O and H antigens of salmonella typhiand H antigens of salmonella paratyphi Aand B.*
Results*: During the study period of 8 months fromNovember 2020 – June 2021, 401 febrilesamples were tested,129 (32%) testedpositive in widal test, 12 (3%) positive onlyfor NS1Ag, 12 (3%) were only IgMpositive, 5 (1%) were both dengue (eitherIgM or NS1Ag or both) and widal testpositive, 243 (61%) were tested negative.Maximum number of typhoid and dengue caseswere seen in the age group of 10-20 years withslight female preponderance with male is tofemale ratio was 0.8:1.*
Conclusion: *In acute febrile illness with diagnostic ambiguity, right choice of laboratory test can diagnose the etiology that helps in timely management and prevent fatal outcomes.*
Key Word*: Dengue & Typhoid fever, Widal test, NS1 Ag, IgM, ELISA*

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I. Introduction

Acute and subacute febrile illness is a common clinical syndrome among patients seeking hospital care in India,[1]inwhich duration of fever lasts up to 14 days. Developing nations share the highest burden of diseases like dengue and typhoid fever. Dengue fever usually presents with symptoms of flu like illness, with high grade fever, generalizedbody ache, nausea and vomiting as well as maculopapular rashes and may mimic other diseases such as typhoid, which is a water borne disease and other mosquito borne diseases like chikungunya, malaria.[1] Thereby it makes accurate clinical diagnosis and treatment difficult without laboratory confirmation.[1] Dengue and Typhoid fever if not approached timely may lead to life threatening consequences.[1]

Thus, serological diagnosis of typhoid fever by widal test and dengue fever by IgM ELISA and NS1 AgELISA was done during the study period of 8 months.

II. Material And Methods

The present cross-sectional study was conducted at Government fever Hospital, Nallakunta, Hyderabad, Telangana from November 2020 to June 2021 after obtaining institutional ethical committee approval. A total of 401 blood samples from both sexes of all age groups presented with complaints of fever with duration of up to 14 days and giving consent were included in the study

Then 5ml & 2ml blood was collected from each patient. Blood was centrifuged at 3000g for 10 minutes and serum stored at 20^0 C for serological testing. Widal test was performed with slide agglutination method. ELISA was done for Dengue IgM and NS1 Ag.

III. Results

During the study period of 8 months fromNovember 2020 – June 2021, 401 febrilesamples were received in the microbiology laboratory. All the samples were tested for typhoid fever by widal test with slide agglutination method and for dengue fever by NS1 Ag ELISA and IgM ELISA. Of these 401 samples, 158

samples were positive (either Typhoid or Dengue or Both). Of these 158 positive samples, 129 (32%) testedpositive in widal test, 24(6%) positive for dengue fever. Among 24 samples 12 (3%) positive onlyfor NS1Ag, 12 (3%) were only IgMpositive, 5 (1%) were bothdengue (eitherIgM or NS1Ag or both) and widal testpositive, 243 (61%) were tested negativefor both Typhoid and Dengue fever as shown in (figure 1)

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Maximum number of typhoid and dengue caseswere seen in the age group of 10-20 years. Among 158 positive samples, 71 were of males and 87 were of females with male is to female ratio was 0.8:1.

Of these 61 males and 68 females were tested positive only in widal test, 4 males and 8 females were only dengue IgM positive, 5 males and 7 females were positive only for dengue NS1 Ag, only 1 male and 4 females were both widal and Dengue(either IgM or NS1Ag or both) positive as shown in (figure 2)

FIGURE 1

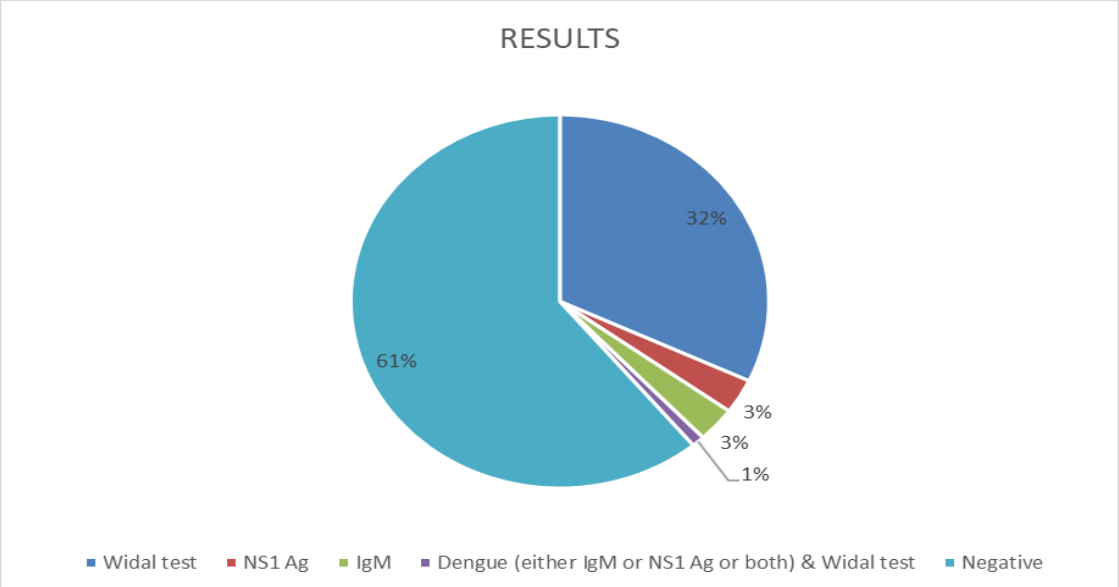
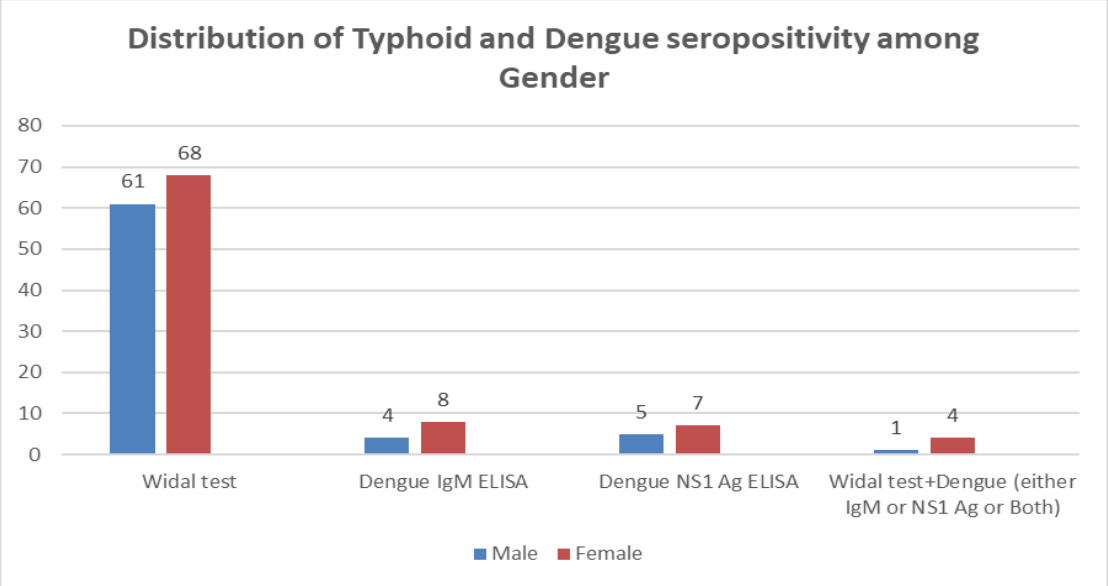


FIGURE 2



IV. Discussion

Dengue and typhoid fever are notifiable diseases in India.[2] Both diseases contribute majorly to the public health problems especially during the monsoons.[2] Due to the varied clinical presentations, these diseases are often under reported or misdiagnosed.[2]If not diagnosed and treated promptly both dengue and typhoid can progress into similar life-threatening complications such as septic shock and multi organ failure.[2]

The present study was conducted at atertiary care hospital comprising 401 febrile blood samples with 32% Widal test positivity and it is 17.6%in the study done by Sapna Chauhan et al.,[3]

In the present study dengue fever positivity is 6% with 3% of samples only NS1 Ag positive and 3% of samples only IgM positive. The study done by Sapna Chauhan et al shows 38.2% positivity for dengue fever (either NS1 Ag or IgM or both)[3.]

In this study only 1% of samples are both Dengue (either NS1 Ag 0r IgM or both) and widal test positive and it is 6.9% and 3.5% in the study done by Sapna Chauhan et al.and Dr Monika Agarwal et al. respectively.[3,4)]

In the present study, dengue and typhoid fever was more in females compared to males with male is to female ratio was 0.8:1 which is similar to the study done by Arun Kumar Mahato et al., (0.8:1)[5.]In the present study maximum number of positive cases were noted in the age group of 10-20 years, in the study done by Shruthi Vimal et al.it is 31-40 years age group people.[7]

Comparison of present study with Different studies

Reference	Total samples tested	Widal test	Dengue NS1 Ag	Dengue IgM	Dengue & Typhoid coinfection	Age group more Affected
Sapna Chauhan et al[3]	403	71	154 (either Ns1 Ag or IgM or both)		28	11-20 years
Dr Monika Agarwal et al[4]	251	-	139	40	9	20-40 years
Present study	401	129	12	12	5	10-20 years

V. Conclusion

In acute febrile illness withdiagnostic ambiguity, right choice of laboratorytest can diagnose the etiology that helps in timelymanagement and prevent fatal outcomes.

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