WIDAL TEST: THE LABORATORIAN'S ALBATROSS

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Abstract
Widal Test: The Laboratorian's Albatross is a research that was conducted at Lifelink Specialist Laboratories, Uyo, Nigeria. The dataset consists of 520 respondents who were randomly selected from patients who visited the facility for Laboratory diagnosis over a period of six months. Nine categories of questions were deployed with a total of 24 varieties of questions under them. The results from the study suggest that Medical Doctors' attitudes and referrals may influence the public's perception of Widal test.63.5% of the respondents were self referred; for reason of ill health (90%). Most of them(92.3%) had already taken treatment for typhoid with no improvement in the symptoms (82.1%).The Chi square test results indicate statistical significance ($p<0.05$). There is a higher likelihood of choosing the test to confirm typhoid diagnosis without proper guidance by professionals.

Keywords: Widal test, health care, diagnostic tests, medical referrals,medical doctors

Introduction

The use of the word Laboratorian is not by any means, intended to insult the Medical Laboratory Scientists who have worked hard to ensure that patients identify, and interact only with the qualified personel in the laboratory; and are, by so doing protected from impostors/quacks. Laboratorian is rather used here to ensure that, the target audience relates seamlessly with the content of this paper. Widal test, developed in 1896 and named after its inventor, Georges-Fernand Widal, is an indirect agglutination test for enteric fever or undulant fever whereby bacteria causing typhoid/ paratyphoid fe fever are mixed with a serum containing specific antibodies obtained from an infected individual.

In cases of Salmonella infection, the test assesses for host antibodies to the O soma antigen and the H flagellar antigen of the bacteria.(Khanna et al, 2015) As with all serological tests, the rise in antibody levels needed to perform the diagnosis takes 7–14 days, which limits its applicability in early diagnosis. This therefore makes accuracy in the interpretation of Widal test results critical. The Widal test is positive if the O antigen titre is more than 1:160 in an active infection, or if H antigen titer is more than 1:160 in past infection or in immunized persons.

A single Widal test is of little clinical relevance especially in endemic areas such as Indian subcontinent, Africa and South-east Asia. This is due to recurrent exposure to the typhoid causing bacteria, immunization and high chances of cross-reaction from infections,

such as malaria and non typhoidal salmonella. (Know treatnent.com 2020) The agent in the Widal antigen suspension; 2-mercaptoethanol easily denatures the IgM class of antibodies, so if a decrease in the titer is seen after using this agent, it means the contribution of IgM has been removed leaving only IgG component. The differentiation of antibody classes is important as it allows for the distinction of a recent (IgM) from an old infection (IgG).

Other means of diagnosing Salmonella typhi and paratyphi include cultures of blood, urine and faeces. These organisms produce H^2S from thiosulfate and can be identified easily on differential media such as bismuth sulfite agar (Omlopenia and Lateef 2000; Chesbrough, 2006; CDC 2020). If no other tests (either bacteriologic culture or more specific serology) are available, a fourfold increase in the titre (e.g. from 1:40 to 1:640) in the course of the infection, or a conversion from an IgM reaction to an IgG reaction of at least the same titre, would be consistent with a typhoid infection. The normal widal ranges are between 1:20 and 1:80.

This study seeks to investigate the controversies surrounding the relevance of the Widal test to patient diagnosis, specifically exploring whether ignorance or medical doctors' attitudes influence the general perception of the public.

Methodology

A total of five hundred and twenty (520) participants were randomly selected for this study, irrespective of gender,age,or educational status as communications Were done using interpreter were necessary. The study was conducted within a period of six (6) months; February to July 2024. These were clients presenting voluntarily for laboratory investigations at Lifelink Specialist Laboratories, a privately owned Medical Laboratory in Uyo, Nigeria.

Each respondent was only assigned a unique identification number which sufficed for this study. All responses were tallied under respective subheadings for subsequent statistical analysis. Chi-Square Test was used to investigate whether ignorance or medical doctors' attitudes influenced the general perception of the public.

Results

S/N	Category of Questions	Varieties of Questions	Answer	Score	Percentage
1.	Referral	Who referred you for the lab test	Medical Doctor	37	7.1%
			Relation (including friends)	153	29.4%
			Self-Referral	330	63.5%
2.	Reason for Coming for Widal Test	Which of the following reasons made you consider doing Widal test?	Ill health	468	90%
			Routine check	52	10%
3.	Histotry of Previous Treatment	Have you recently treated this ailment?	YES	380	73.1%
			NO	120	23.1%
			CAN'T RECALL	20	3.8
4.	Treatment Target	Were you Treated for malaria?	YES	480	92.3%
			NO	40	7.7%
5.	Typhoid	Were you Treated For Typhoid?	YES	350	67.3%
			NO	170	32.7%
6.	Malaria & Typhoid	Were you Treated for both malaria and	YES	320	61.5%
			No	200	38.5%

		typhoid ?			
7.	Response to Treatment	Illness symptoms after medication	Resolved	5	1%
			Improved	88	16.9%
			No response	427	82.1%
8.	Lab Test after Previous Treatment	Test required	MP	16	3.1%
			WIDAL	293	56.3%
			MP and Widal	211	40.6%
9.	Knowledge of Widal Test	Why the choice of Widal test?	The malaria is too Much and must Have turned to Typhoid	33	6.3%
			Widal is a wider test that picks any sickness in my body It will show drugs to take	150	28.8%
			To know if I have typhoid	337	64.8%

Most respondents (63.5%) referred themselves, followed by relations/friends (29.4%), and medical doctors (7.1%). The primary reason for seeking medical attention was ill health (90%). 73.1% of respondents had taken medication for their ailments before showing up for Widal test. 92.3% of the 520 had taken malaria treatment while 67.3% on the other hand had taken treatment for typhoid. Symptoms of illness were the reason 82.1% of the respondents visited the laboratory, presenting report of no response to medication as earlier symptoms persisted.

The majority of respondents in this category (56.3%) required a Widal test. The primary reason for choosing the Widal test was to confirm typhoid diagnosis (64.8%). Chi square test results on the variables under consideration were as follows: Referral (medical Doctor vs. self- referral) vs. Why Widal (to confirm typhoid diagnosis vs. other reasons) $x^2(1) =10.23$, $p=0.0014$. Sickness vs. routine check vs. Test Required (Widal vs. other tests) $x^2=5.13$, $p=0.0235$

Discussion

A combination of apathy - on the part of the Medical Doctor, and ignorance on the part of the patients played a pivotal role in the controversies which have followed the Widal test for over a century after its discovery. A paultry 7 .1% of the sample population were referred by Medical Doctors. The chi-square test results indicate statistical significance ($p < 0.05$) for both analyses, suggesting that the observed associations are unlikely to occur by chance.

Medical Doctors' dispassion towards exploring possibilities of strategically positioning Widal test as a guide for the diagnosis of Salmonella infections. This therefore leaves over 90% of the request for Widal test in the hands of the ignorant public who neither know what the test is about nor how to interpret the results. The classification of the respondents' ignorance was demonstrated in question category nine (9) clearly speak to the level of ignorance prevalent among the population of individuals currently visiting laboratories for Widal test. This ranges from the notion that Widal test is the same thing as "wider test" which would offer them opportunity to undergo a kind of comprehensive test with capacity to pick any form of infection; from viral, bacterial to fungal.

Other misconceptions about Widal test in the study were that it deals with higher levels of malaria which had become typhoid and so needed "wider" test to help know what drug the agent is sensitive to. The high proportion of patients with requests for Widal test (96.9%) is a confirmation that the test is still in high demand among the patients. Before Widal test could be jettisoned, the healthcare system must provide an effective and affordable alternative.

Tubex is a new serological test in that direction, to help in ascertaining the diagnosis of typhoid fever. However, Tubex test has been discovered neither to be superior nor better performing than the Widal test. Therefore, Tubex test is not recommended over Widal test. (Bakr et al 2020). Culture test has its own limitations: first, the long time (4-5days) required (Chesbrough, 2006) to produce a conclusive test result makes it unsuitable for emergency cases.

Additionally, as observed among our respondents, a good number of patients (67.3%) before showing up for Laboratory diagnosis had already taken antibiotics for other conditions. This act may inhibit Salmonella and make its isolation in the Laboratory difficult-even when the patient has typhoid. Finally, the cost implication of running blood, urine, and faeces cultures at the same time is not within the reach of the poor patients.

Opponents of the use of Widal test for the diagnosis of typhoid fever argue that, most symptoms presented by patients who demand Widal test are malaria symptoms. But our study showed that 92.3% of patients in this category had already treated malaria without resolution of the ill health in 82.1% of them. This may suggest that there is a need for more studies by healthcare providers on a more dynamic interpretation of Widal test for the patients' benefits.

Conclusion

The result from the study suggests that: medical doctors' attitudes and referrals may influence the public's perception of the Widal test. Only 7.1% of the study population was referred by medical doctors, while 92.9% were either self referred or referred by any other persons beside the medical doctors. Widal test enjoyed preference despite the medical doctors' dispassion towards it, with the attendant misapplication of results by the ignorance patients. There is a higher likelihood of choosing the test to confirm typhoid diagnosis without proper guidance by professionals.

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