

## Routine VDRL Test in Pregnant Women: How Justified Is It?

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### ABSTRACT

**Background & objective:** The present study was undertaken to justify the role of routine antenatal screening for syphilis using the Venereal Disease Research Laboratory (VDRL) test in Bangladeshi pregnant women.

**Methods:** The study was carried out in the Department of Gynecology & Obstetrics Inpatient and Outpatient, Dhaka Medical College Hospital (DMCH) and selected Private Clinics over a period of 6 months between January 2016 to June 2016. Pregnant women attending at the above-mentioned places during the study period were the study population. A total of 371 women attending at antenatal clinic at OPD or admitted in the Inpatient Department of DMCH were consecutively included. The outcome variable was outcome of VDRL test.

**Result:** In the present study, the mean age of the pregnant women was 24.3 years. In terms of occupation, housewife comprised the main bulk (78.8%). About 64% were multigravida and 60% were primipara. Of the 371 pregnant women subjected to VDRL test, only 4(1.1%) exhibited reactive. About one-third of the women had history of past abortion. Of them two-thirds had experienced abortion once. Of the aborted cases 57% were spontaneous and 43% induced. Ten percent of the women gave the history of delivering dead baby. Three-quarters of the dead babies were fresh, 22.2% had skin lesion and only one was macerated. Half of the women had history of vaginal discharge, 27.2% itching in vagina and vulva and 17% dysuria. However, very few husbands had dysuria, pus discharge through urethra or ulcer in the genital region. About 10% of women gave the history ophthalmia neonatrum in their children born in the past. History of dysuria was rare (0.8%), but pus discharged from urethra of their husbands was 12.1%. HbsAg was found positive in 5(1.3%) cases and pus-cell in urine in 41(11.1%) cases.

**Conclusion:** The study concluded that pregnant women with VDRL test positivity in Bangladeshi population are low and, as such, the role of routine antenatal screening for syphilis with VDRL test should be re-considered.

**Key words:** Routine VDRL, Pregnant women etc.

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## INTRODUCTION:

Syphilis is a sexually transmitted disease (STD) caused by *Treponema pallidum*. *Treponema pallidum*, an obligatory parasite of man and found in lesions of syphilis, is an extremely delicate spiral organisms with axial filament having 3-4 fibrils possessing characteristic motility.<sup>1</sup> The Venereal Disease Research Laboratory (VDRL) is a blood test that is used to determine whether a person has an active syphilis. The VDRL test, a slide microflocculation test for syphilis, use an antigen containing cardiolipin, lecithin, and cholesterol.<sup>2,3</sup> It is a fast, easy to perform test that measures IgM and IgG antibodies to lipoidal material released from damaged host cells as well as to lipoprotein-like material, and possibly cardiolipin released from the *Treponemas*.<sup>4,5</sup> The antilipoidal antibodies are antibodies that are not only produced as a consequence of syphilis and other treponemal diseases, but may also be produced in response to non-treponemal diseases of an acute and chronic nature in which tissue damage occurs.<sup>6</sup> Without some other evidence for the diagnosis of syphilis, a reactive non-treponemal test does not confirm *T. pallidum* infection. Although a positive test usually means that the individual has syphilis, the fact that VDRL looks for antibodies to a non-syphilis specific protein called cardiolipin may lead to false positive result (1-2%) as well, which can be caused by many conditions including pregnancy, HIV infection, tuberculosis and some other bacterial infection.<sup>7</sup>

The American Academy of Pediatrics and the American College of Obstetricians and Gynecologists recommend that all pregnant women be screened for syphilis with serologic testing at the first prenatal visit, after exposure to an infected partner and at the time of delivery.<sup>8</sup> A group of researchers from departments of Clinical Microbiology, Christian Medical Collage Hospital, Velour, Tamil Nadu, India did an audit on "The management of pregnant women with positive VDRL tests". Their work shows that only less than 1% pregnant women were positive for VDRL test. Of the sera positive women only one-third have

had foetal loss.<sup>9</sup> The US preventive services task force (USPSTF) has done "screening for syphilis infection" and strongly recommended that clinicians should screen persons at increased risk for syphilis infection. As screening may result in potential harms (such as clinical evaluation of false- positive results, unnecessary anxiety to the patient and harms of antibiotic use), the USPSTF recommends against routine screening of asymptomatic persons who are not at increased risk for syphilis infections.<sup>10</sup>

In Bangladesh, different studies conducted during 1994 to 2001 on prevalence of sexually transmitted infections (STIs) among urban and rural female populations. While most of the studies were clinic-based, there are few community-based studies. The cumulative data from all these studies showed that the prevalence of *N. gonorrhoea* and *C. trachomatis* is 0.2-2.4% respectively and the prevalence of syphilis is 0.7-3%. In pregnant women from urban Dhaka (n=281), prevalence of syphilis was 3%. Among females of moderate risk groups, the prevalence of syphilis was 1.5-3%.<sup>10</sup>

Syphilis screening and treatment in the antenatal care is an effective way to reduce fetal or infant mortality and morbidity. Therefore, the practice of universal antenatal screening for syphilis has been advised. However, its routine use has been questioned in many societies, particularly in conservative society like Bangladesh, because of extremely low prevalence of syphilis.<sup>11</sup> The present study was designed to generate information that may help Obstetricians to decide whether routine VDRL test is justified in Bangladeshi pregnant woman seeking antenatal care.

## METHODS:

This Cross-sectional study was carried out on pregnant women in the Department of Gynecology & Obstetrics Inpatient and Outpatient, Dhaka Medical College Hospital and in the selected Private Clinics over a period 6 months between January 2016 to June 2016. Having obtained

ethical clearance from the Ethical Committee and verbal consent from the patients, the data collection was commenced. Pregnant women irrespective of age, parity and duration of pregnancy, having report of VDRL test at any registered diagnostic center/clinics carried out during this pregnancy and were willing to repeat VDRL test if requested were included. However, very sick pregnant women admitted in hospital ward for treatment of any other conditions or unable to show the needed reports on the day of interview were excluded. A total of 371 patients were selected. The key variables of interest were history suggestive of possible STI, history strongly suggestive of STI, outcome of VDRL test and outcome of baby of VDRL positive mother. Data processing and analysis were done using SPSS (statistical package for social sciences), version 16. The test statistics used to analyze the data were descriptive statistics. The categorical data were presented as frequency and corresponding percentages, while the continuous data were presented as mean, standard deviation from the mean and range.

## RESULTS:

Age distribution shows that 27.8% were < 20 years, 57.1% were 20-30 years and 25.1% 30 or > 30 years with mean age of the patients being 24.3 years. In terms of occupation, housewife comprised the main bulk (78.8%). Over one-quarter (27%) was secondary level educated, 21.8% primary level, 19.4% SSC, 15.4% graduate and 9.4% HSC level educated. Muslim was predominant (94.6%). Average monthly income was Taka 9774 (Table I).

Over half (51.8%) of the husbands were < 30 years old, 33.7% were 30-40 years and 12.9% 40-50 years old with mean age of the husbands being 31.8 years. They were predominantly Muslim (94.1%). Service was the prime occupation (45.6%), followed by business (32.9%) & labour (7%). Secondary, SSC and HSC level educated each comprised 20%. The average monthly income was Taka 20432 (Table II).

**Table I. Distribution of respondents by their demographic features(n=371)**

| Demographic features | Frequency | Percentage | Mean±SD (Range)     |
|----------------------|-----------|------------|---------------------|
| <b>Age* (years)</b>  |           |            |                     |
| <20                  | 103       | 27.8       | 24.3 ± 4.6(17 – 40) |
| 20 – 30              | 212       | 57.1       | -                   |
| ≥30                  | 56        | 15.1       | -                   |
| <b>Occupation</b>    |           |            |                     |
| Housewife            | 292       | 78.8       | -                   |
| Student              | 12        | 3.2        | -                   |
| Service              | 12        | 3.2        | -                   |
| Others               | 55        | 14.8       | -                   |
| <b>Education</b>     |           |            |                     |
| Illiterate           | 26        | 7.0        | -                   |
| Primary              | 81        | 21.8       | -                   |
| Secondary            | 100       | 27.0       | -                   |
| SSC                  | 72        | 19.4       | -                   |
| HSC                  | 35        | 9.4        | -                   |
| Graduate             | 57        | 15.4       | -                   |
| <b>Income (Tk.)</b>  | -         | -          | 9774.2 ± 6596.5     |
| <b>Religion</b>      |           |            |                     |
| Muslim               | 351       | 94.6       | -                   |
| Hindu                | 20        | 5.4        | -                   |

**Table II. Distribution of respondents by demographic features of their husband (n=371)**

| Particulars of husband | Frequency | Percentage | Mean±SD (Range)      |
|------------------------|-----------|------------|----------------------|
| <b>Age (years)</b>     |           |            | (31.8 ± 5.9) (20-60) |
| <30                    | 192       | 51.8       | -                    |
| 30-40                  | 125       | 33.7       | -                    |
| 40-50                  | 48        | 12.9       | -                    |
| ≥50                    | 6         | 1.6        | -                    |
| <b>Occupation</b>      |           |            |                      |
| Service                | 169       | 45.6       | -                    |
| Business               | 122       | 32.9       | -                    |
| Labour                 | 26        | 7.0        | -                    |
| Others                 | 54        | 14.3       | -                    |
| <b>Education</b>       |           |            |                      |
| Illiterate             | 21        | 5.7        | -                    |
| Primary                | 51        | 13.7       | -                    |
| Secondary              | 72        | 19.4       | -                    |
| SSC                    | 73        | 19.7       | -                    |
| HSC                    | 67        | 18.1       | -                    |
| Graduate               | 87        | 23.5       | -                    |
| <b>Income (Tk.)</b>    | -         | -          | 20432.8 ± 1924.9     |
| <b>Religion</b>        |           |            |                      |
| Muslim                 | 349       | 94.1       | -                    |
| Hindu                  | 22        | 5.9        | -                    |

About 64% of the respondents were multigravida and 36% primigravida. In terms of parity 59.5% were primipara and 40.5% multipara (Table III). About one-third (31.5%) of the women had history of past abortion. Of them two-thirds (67.6%) experienced abortion once, 24.4% twice and 7.7% 3 times. Of the aborted cases, 57.1% had spontaneous abortion and 42.9% had induced abortion. Duration of gestation in 1<sup>st</sup> abortion was about 12 weeks. Thirteen percent developed complications. Sixty percent of the 2<sup>nd</sup> abortion was spontaneous with average duration of gestation being 10.6 weeks. The data of 3<sup>rd</sup> abortion are illustrated in Table III.

**Table III. Distribution of respondents by pregnancy profile & abortion history (n = 371)**

| Pregnancy profile & abortion history           | Frequency | Percentage | Mean±SD (Range) |
|--|-----------|------------|-----------------|
| <b>Gravida &amp; parity</b>                    |           |            |                 |
| Gravida  |           |            |                 |
| Primigravida                                   | 134       | 36.1       | -               |
| Multigravida                                   | 237       | 63.9       | -               |
| <b>Parity</b>                                  |           |            |                 |
| Primipara                                      | 221       | 59.5       | -               |
| Multipara                                      | 150       | 40.5       | -               |
| <b>Abortion history</b>                        |           |            |                 |
| <b>Past abortion</b>                           |           |            |                 |
| How many abortion (n = 117)                    |           |            |                 |
| 1 times  | 79        | 67.6       | -               |
| 2 times  | 29        | 24.7       | -               |
| 3 times  | 9         | 7.7        | -               |
| Duration of gestation 1 <sup>st</sup> abortion | -         | -          | 11.9 ± 6.8      |
| <b>Nature of 1<sup>st</sup> abortion</b>       |           |            |                 |
| Spontaneous                                    | 64        | 57.1       | -               |
| Induced  | 48        | 42.9       | -               |
| Health complication 1 <sup>st</sup> abortion   | 14        | 13.2       | -               |
| Duration of gestation 2 <sup>nd</sup> abortion | -         | -          | 10.6 ± 6.9      |
| <b>Nature 2<sup>nd</sup> abortion</b>          |           |            |                 |
| Spontaneous                                    | 20        | 60.6       | -               |
| Induce   | 13        | 39.4       | -               |
| Health complication 2 <sup>nd</sup> abortion   | 3         | 9.1        | -               |
| Duration of gestation 3 <sup>rd</sup> abortion | -         | -          | 14.8 ± 5.2      |
| <b>Nature 3<sup>rd</sup> abortion</b>          |           |            |                 |
| Spontaneous                                    | 4         | 80.0       | -               |
| Induce   | 1         | 20.0       | -               |
| Health complication 3 <sup>rd</sup> abortion   | 1         | 20.0       | -               |

**Table IV. Distribution of respondents by their history of dead baby (n = 371)**

| History of dead baby          | Frequency | Percentage | Mean±SD (Range) |
|-------------------------------|-----------|------------|-----------------|
| Still born                    | 36        | 9.7        | -               |
| Duration of gestation (weeks) |           |            | 31.3 ± 13.4     |
| Maternal health complication  | 5         | 13.9       | -               |
| <b>Types (n = 36)</b>         |           |            |                 |
| Fresh                         | 27        | 75.0       | -               |
| Skin lesion                   | 8         | 22.2       | -               |
| Macerated                     | 1         | 2.8        | -               |
| <b>Sex</b>                    |           |            |                 |
| Male                          | 18        | 50.0       | -               |
| Female                        | 18        | 50.0       | -               |
| <b>Place of delivery</b>      |           |            |                 |
| Home                          | 12        | 33.3       | -               |
| Hospital                      | 24        | 66.7       | -               |

**Table V. Distribution of respondents by complications of wife & husband (n = 371\*)**

| Complications of wife & husband | Frequency | Percentage |
|---------------------------------|-----------|------------|
| <b>Complications of wife</b>    |           |            |
| Vaginal discharge               | 184       | 49.6       |
| Itching in vagina/vulva         | 101       | 27.2       |
| Dysuria                         | 63        | 17.0       |
| Any ulcer in the genital region | 2         | 0.5        |
| <b>Complications of husband</b> |           |            |
| Dysuria                         | 18        | 4.9        |
| Pus discharge through urethra   | 14        | 3.8        |
| Any ulcer in the genital region | 8         | 2.2        |

\* Total will not correspond to 100%, for multiple response

**Table VI. Distribution of respondents by their past history of medical significance**

| past history of medical significance        | Frequency | Percentage |
|---|-----------|------------|
| <b>Past history of medical significance</b> |           |            |
| Ophthalmia Neonatorum in new-born in past   | 36        | 9.7        |
| History of dysuria of husbands              | 3         | 0.8        |
| Pus discharged from urethra of husbands     | 45        | 12.1       |
| <b>Laboratory tests findings</b>            |           |            |
| <b>HbsAg</b>                                |           |            |
| Negative                                    | 366       | 98.7       |
| Positive                                    | 5         | 1.3        |
| <b>Urine R/E</b>                            |           |            |
| NAD   | 330       | 88.9       |
| Pus cell                                    | 41        | 11.1       |

**Table VII. Distribution of respondents by their VDRL test findings (n=371)**

| VDRL         | Frequency | Percentage |
|--------------|-----------|------------|
| Reactive     | 4         | 1.1        |
| Non-reactive | 367       | 98.9       |

About 10% of the women gave the history of dead baby with average duration of gestation being 31.3 weeks. Of them 13.9% had maternal complications. Three-quarters of the dead babies were fresh, 22.2% had skin lesion and only one was macerated. Male and females were equal in number. Two-thirds (66.7%) of the babies were born in hospital and the rest at home (Table IV). About half (49.6%) of the women had history of vaginal discharge, 27.2% itching in vagina and vulva and 17% dysuria. However, very few husbands had dysuria (4.9%), pus discharge through urethra (3.8%) and any ulcer in the genital region (2.2%) (Table V). About 10% of women gave the history of ophthalmia neonatorum in their children born in the past. History of dysuria was rare (0.8%), but pus discharged from urethra of their husbands was reported in 12.1% cases. HbsAg was found positive in 5(1.3%) cases and pus-cell in urine was found in 41(11.1%) cases. (Table VI). Of the 371 cases subjected to VDRL test, only 4(1.1%) exhibited reactive. However, the babies of VDRL positive mothers did not have any problem (Table VII).

## DISCUSSION:

In the present study out of 371 pregnant women subjected to VDRL test, only 4(1.1%) exhibited weakly reactive. About one-third of these women had history of past abortion. Of the aborted cases 57% were spontaneous and 43% induced. Ten percent of the women gave the history of delivering dead baby. Three-quarters of the dead babies were fresh, 22.2% had skin lesion and only one was macerated. Half of the women had history of vaginal discharge, 27.2% itching in vagina and vulva and 17% dysuria. However, very few of their husbands had dysuria, discharge of pus through urethra and any ulcer in the genital region. About 10% of women gave the history of

ophthalmia neonatorum in their children born in the past. History of dysuria was rare (0.8%), but pus discharged from urethra of their husbands was reported in 12% cases. HbsAg was found positive in 5(1.3%) cases and pus-cell in urine was found in 41(11.1%) cases.

The values of the VDRL test lies in its low cost and ease of titration. Prevalence of syphilis in pregnant women in developing countries ranges from 3-18%.<sup>12,13</sup> The prevalence of VDRL reactive in our study is 1.1% which does not mean that the prevalence of syphilis is 1.1%. A study performed in Amazon region, Brazil on 712 pregnant women under field conditions in remote communities where fluorescent treponemal antibody absorption (FTA-Abs) test was considered as the 'gold standard' and the VDRL test was done to determine the active syphilis cases. Among women, 2.2% had syphilis (Positive FTA-Abs) and 0.8% active syphilis (FTA-Abs and VDRL positive). The sensitivity & specificity of the test was 62.5% and 99.1% (Final Recommendation Statement: Syphilis Infection: Screening, 2014). If we consider that the sensitivity of the test is 62%, than the prevalence of syphilis is assumed to be 0.62% which is quite comparable with the prevalence of syphilis in a Nigerian study (0.55%)<sup>14</sup> and that in a Maiduguri (Northern Nigeria) study (0.05%)<sup>13</sup> but significantly less than 10% prevalence reported from Oshogbo (Western Nigeria).<sup>15</sup> In Enugu (South Eastern Nigeria) screening values of 3.06%, 1.3% and 0.125% have been reported by successive studies<sup>16-18</sup> indicating that the prevalence of syphilis is decreasing. While the VDRL test is useful in screening infectious syphilis, it may fail to diagnose the primary disease. However, it is still useful and considered most sensitive in latent syphilis.

Most pregnant women with syphilis are asymptomatic and the disease can only be identified through screening programs. Routine prenatal VDRL test can detect syphilis allowing timely intervention to prevent adverse pregnancy outcomes and neonatal infection with syphilis.<sup>19-21</sup> Transmission occurs more commonly in the last

two trimesters, but the spirochete can cross the placenta at any time during pregnancy.<sup>22</sup> Therefore, fetal death and morbidity due to congenital syphilis are preventable if the infected mother is identified and treated appropriately by the middle of the second trimester.

But in a population with extremely low rate of syphilis, the value of routine testing with VDRL should be reconsidered. Data on syphilis in obstetric population in Saudi Arabia is limited, but in general it is in line with the notion of low prevalence (0.03-0.85%).<sup>23-25</sup> Hamdi & associates<sup>26</sup> in another study in Saudi Arabia showed that the relative frequencies for syphilis among domestic expatriate workers (DEWs) screened for pre-employment is 23.8%, more frequent among Indonesian and the Philippines nationals. The findings obtained from the present study supports that the prevalence of syphilis in conservative population like ours is extremely low and routine investigation for syphilis using VDRL test is of little value. It unnecessarily increases burden of the cost and anxiety of the women concerned as well as her families.

### CONCLUSION:

The study concluded that only one in hundred Bangladeshi pregnant women exhibits reactive VDRL test. As the sensitivity of the test is low, the prevalence of syphilis is even low (less than one percent). Therefore, the role of routine antenatal screening for syphilis with VDRL test in Bangladeshi population should be re-considered.

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