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Prevalence And Factors Associated with Syphilis (A case study of Sir Yahaya Memorial Hospital Kebbi State)

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Abstract- ***This study was conducted to know the sexually transmitted disease (STD) prevalence and its associated factors among patients attending sexually transmitted disease clinics at Sir Yahaya memorial hospital. The most commonly associated factor based on the research findings are multiple sexual partners among prostitutes, also men who have sex with men (MSM). Method of logistic regression is implemented for the analysis. The result of the study revealed that tribe (indigene and non-indigene) contributing 2.72 times higher for the odds or chances of contracting syphilis. Since most diseases are of social nature, information education communication (IEC) activities to improve the awareness in the community about sexually transmitted diseases (STD) and about risk factors associated with them should bring behavior related risk taking among people spreading sexually transmitted diseases (STD) in the community.***

Keywords: Syphilis, prevalence, logistic regression, sexually transmitted infections, Nigeria

I. INTRODUCTION

1.0 BACKGROUND OF THE STUDY

Syphilis is a chronic infectious disease that has challenged humanity for centuries. It affects practically all organs and systems and in spite of having an efficacious and low-cost treatment. In (1905), Schaudinn and Hoffmann discovered Treponema Pallidum in tissue of patients with syphilis. One year later, the first effective test for syphilis, the Wassermann test, was developed. Although it had some positive results, it was a major advance in the detection and prevention of syphilis. By allowing testing before the acute symptoms of the disease had developed, this test allowed the prevention of transmission of syphilis to others, even though it did not provide a cure for those infected. German Bacteriologist August Von Wassermann, working in conjunction with Robert Neisser, discovered the Wassermann reaction, a blood serum test that could be determined if a person had syphilis. German Scientist Ehrlich, in (1908), began his research to find a better drug to fight the disease by testing hundreds of different arsenic compounds on syphilitic rats. One compound was found to effectively destroy syphilis without destroying the rat. He called it Neosalvarsan, which in English means “I save”. Treponema pallidum is the bacterium that causes syphilis. Syphilis can move throughout the body, damaging many organs over time. After initial penetration, the bacteria enter the lymph capillaries, where they are transported to the nearest lymph gland. There, they multiply and are released into the bloodstream, where they invade utery part of the body.

Holmes (1999), the worldwide re-emergence of syphilis brought this complex sexual infection back to mainstream medicine. In the (1990s) there has been documented insurgence of infectious syphilis beginning Europe, predominantly among those who have sex with men (MSM) syphilis has a myriad of presentations and can mimic many other infection and immune mediated diseases. The complex and variable manifestations of disease mean that vigilant is required in every medical discipline. Reports of local outbreaks have made reference to the diagnostic difficulties in order to remind clinicians to think syphilis when encountering such patients, the control of syphilis requires early identification and treatment of diseases. This call for a test that are easily administered, interpreted and treatment that is fast and side effect free. Syphilis is a sexually transmitted disease that begins with genital scores, progressive to a general rash, and then to disfiguring abscesses all over the body. In its late stages, untreated syphilis can cause heart abnormalities disorders, blindness, other neurological problems and death. It appeared

prominently in Europe at the end of fourteen century and by (1500) had spread too much of the continent explorer Vasco (1498) and by (1520), syphilis had reached Africa and China. It was considered the sexual scourge of the sixteen centuries.

Raymond SW Tsang PhD et al (2009), field microscopy allows immediate diagnosis of early syphilis but it is on the clinical suspecting and performing dark ground testing of lesions. Dark field microscopy is saprophytic spirochetes. Immune fluorescence's is more sensitive and does not have to be carried out immediately while dark field examination and immune fluorescence provide act of evidence infection that are not widely available. More commonly syphilis diagnosed brings a combination of Treponemal and non-Treponemal serological tests. Serological test will provide only presumptive results as the organism is not directly identified.

Surveill (1999), syphilis remains as an important cause of morbidity, mortality and a possible transmission factor in the spread of HIV infection. With the increasing prevalence of infectious syphilis clinical vigilance and increased testing for syphilis is warranted. Further development point of care screening kits currently underway will aid with the expansion of screening diagrams. Effective treatment is widely available in the form of penicillin. However, there is a need for further evaluation in large scale randomized controlled trials of treatment regimens. The natural history of disease shows an evolution that alternate periods of activity with distinct clinical immune and histopathological characteristics (primary, secondary and tertiary syphilis) and period of latency (Latent syphilis). Syphilis can be further divide into recent syphilis, in cases when the diagnosis is made within one year after infection, and late syphilis. When the diagnosis occurs after one year.

1.1 STATEMENT OF THE PROBLEM

Dr. Charles Rein (1957) expressed that, in spite great advances, syphilis would sooner or later recrudesce to a major problem. It is however, becoming increasingly apparent that syphilis, in spite of the fears, is rapidly taking a less importance in medical practice; in fact, some investigators believe that the diminution of syphilis incidence is so great as to make it an uncommon or even rare disease, a situation which person feel more permanent. Although many advances have been made, there are still numerous unanswered problems connected with syphilis as well as with the other Treponemal disease. Despite the progress made in reducing the mortality from syphilis, it still remains 0one of the more importance causes of death among infectious processes. Notwithstanding the great advances, one must keep in mind Neisser`s dictum "Human indolence will agree that syphilis will die out but will remain always a dangerous disease"

1.2SIGNIFICANCE OF THE STUDY

To add to the existing knowledge on the syphilis infection

To give the health practitioner, researcher's insight on how to control the spread of the disease

To provide useful information for health planner and policy maker on prevention and control of syphilis

1.3AIM AND OBJECTIVES OF THE STUDY

To highlight on factors Responsible for occurrence of syphilis and provide a means of reducing its prevalence among human population in Kebbi State.

To know the factors that are contributing to occurrence of syphilis base on age, sex and tribe (indigene or non-indigene).

To know the effect of Syphilis on Human life using logistic regression analysis to test the significant.

1.4 SCOPE AND LIMITATION

An Epidemiological investigation and clinical characteristics analysis of syphilis patients was performed at the STI clinic. All information was collected through face-to-face interviews that were conducted by clinical staff. The data were collected through Retrospective study by reviewing the medical record of patients attending STI clinic at Sir Yahaya memorial hospital, Kebbi State. Data Analysis is limited to Binary Logistic Regression.

1.5 DEFINITION OF TERMS

Syphilis is a persistent highly infectious Sexually transmitted disease (STD) that can have devastating consequences. It is caused by spiral shape bacterium (spirochete) Treponemal Palladium, which can live almost anywhere in the body and spread rapidly. This bacterium is classified under spirochetes phylum,

spirochaetes order, Spirochetosis family, but there are at least three more known species causing human Treponemal diseases such as Treponemal pertnue that causes yaws, Treponemal carateum causing pinta and Treponemal palladium endemism responsible for bejel or endemic syphilis.

The four members of the bacterial family cannot be differentiated with morphological, chemical or immunological methods of the aforementioned bacteria; syphilis is the sole sexually transmitted Treponemal disease, as the other conditions are transmitted via direct contact with an infected individual. Syphilis cannot be caught through casual contact, such as toilet seats sharing and cutleries.

Syphilis can be successfully treated with antibiotics. Catching syphilis increases the chances of catching HIV. Also, HIV will alter the typical course of syphilis, increases the chances of progressing to tertiary syphilis, William (1996)

II. REVIEW OF LITERATURE

In this chapter, a review of the existing literature has been made with regards to prevalence, transmission, clinical presentation, diagnosis, treatment, prevention, and complications of syphilis. Textbooks, peer-reviewed journals, reports of international health organizations, and credible sources on the internet were sources of relevant information. The review gives the past and current insights about syphilis and its role in the health of the people dimension along with some of the reasons that have contributed to its continued existence especially in developing nations.
The disease has been known at all times to cause significant morbidity and mortality due to syphilis. According to Walker (2002), the late-stage disease was well-documented because of the severe neurological and behavioral symptoms. Syphilis has also historically been reflected in literature and art because of its extensive social influence. Syphilis has been a health issue of concern in the whole world despite the progress in diagnosis and treatment.

Since the introduction of penicillin in the 1940s, the cases of syphilis in developed nations have decreased dramatically, though there are still the so-called sporadic epidemics especially among high-risk groups of people like men who have sex with men (MSM) and people with HIV (John, 2008). In most developing nations, syphilis has been very high and it also causes serious reproductive and neonatal problems.

The World Health Organization (WHO, 2016) defines syphilis as a sexually transmitted infection (STI) transmitted by the bacterium Treponema pallidum and is related to high morbidity and mortality. Specifically, it is important to mention that it contributes to the spread of HIV and can be vertically transmitted during pregnancy and cause syphilis in the newborn and perinatal mortality (Morwitz and Hicks, 2017).

2.1 Origin of Syphilis

The precise cause of syphilis is still unclear and two major theories have been put forward including the Columbian theory and pre-Columbian theory. The Columbian theory postulates the importation of syphilis into Europe by the Americans after the journeys of Christopher Columbus, but the pre-Columbian theory argues that the treponemal diseases were prevalent worldwide even before the coming of the Europeans.

The Unitarian theory, according to which venereal and non-venereal forms of the treponema syphilis and yaws, pinta, endemic syphilis are the same infection, but clinical manifestations depend on environmental, climatic, and sociocultural conditions, is related to it.
Harper et al. (2011) carried out a systematic review of paleopathological evidence of the treponemal disease in pre-Columbian populations of the Old World. On the basis of stringent criteria of diagnostic and radiocarbon dating they discovered no confirmed cases of venereal syphilis in the Old World before contact with the Americas, which gives high credibility to the Columbian hypothesis.

2.2 Alternative Names of Syphilis

In 1530, an Italian physician and poet Girolamo Fracastoro in his Latin poem Syphilis save morbus galligus, coined the term syphilis. Historically the disease was known by different nationalistic names, which highlight the tension of the sociopolitical situation and the habit of finding an external population guilty. As an example it was referred to as

the French disease in Italy, the Italian disease in France, the Spanish disease in the Netherlands and the Polish disease in Russia.

The syphilis was also popularly known by the name Great pox as a way of differentiating it with that of small pox. Such other names highlight the stigma and fear of the disease in the past.

2.3 Clinical Manifestations of Syphilis

Syphilis is a chronic systemic infection with varying phases of clinical and latent phases. Classical classifications of the disease include primary, secondary, latent and tertiary. Neurosyphilis can happen at any stage.

Primary Syphilis

Primary syphilis normally has a period of approximately three weeks of infection without any pain at the point of inoculation in the form of an ulcer called a chancre. The chancre is hard, well delineated, and normally combined with non-tender regional lymphadenopathy. The lesion heals in the majority of cases, without scarring and in a period ranging between four and five weeks.

Secondary Syphilis

Syphilis Secondary syphilis ensues weeks to months after the initial stage and is caused by dissemination of T. pallidum throughout the body. It is also associated with a broad spectrum of appearances, which include symmetrical skin rashes (which are commonly found on the palm and the soles), mucocutaneous lesions, lymphadenopathy and systemic symptoms. The symptoms can either disappear without treatment, resulting into the latent stage.

Latent Syphilis

Latent syphilis refers to a situation where one has a serological test that is a sign of infection without any clinical manifestation. It is either early latent (in one year of infection) or latent late (more than one year). Though the natural carriers are asymptomatic, they are still prone to developing the tertiary disease.

- Tertiary Syphilis

The tertiary syphilis is a condition that may occur many years or decades after the first infection and it can involve various organ systems. Gummous lesions, cardiovascular syphilis and neurosyphilis are some of the clinical manifestations. These complications may be dangerous and life threatening.

- *Neurosyphilis*

Neurosyphilis is an invasion of T. pallidum of the central nervous system and this can be seen at any stage. It is more likely to be reported in persons who are HIV-infected. It has clinical characteristics such as headache, cognitive deficiency, visual effects, and stroke-like symptoms.

2.4 Diagnostic Tests for Syphilis

Syphilis is diagnosed in the laboratory through a blend of clinical and serology diagnosis. The first effective serological syphilis test historically was the Wassermann test which was developed in 1906 but was hampered by false-positive results. This was subsequently optimized with flocculation tests that included the Hinton test.

The current methods of diagnosis involve direct tests, which comprise dark-field microscopy of lesion exudate, as well as serological tests. Non-treponemal tests (e.g., VDRL and RPR) are used in screening and monitoring of the disease and the treponemal tests (e.g., FTA-ABS) are used in confirmation. Neurosyphilis diagnosis is done by analyzing cerebrospinal fluid; this includes VDRL testing, leukocytes, and the concentration of protein.

2.5 Treatment of Syphilis

Treatments used in the past to cure syphilis were mostly ineffective and contained toxic elements such as mercury and guaiacum. In 1908 the first step in treatment was made with the development of arsenic based compounds including Salvarsan.

At present, penicillin is still the therapy of choice in syphilis at any stage. The only recommended treatment in pregnancy is the parenteral penicillin G. Other regimens, including doxycycline or tetracycline, can be applied in non-pregnant patients, who have an allergy to penicillin, but there is not much evidence to back it up.

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2.6 Prevention and Control of Syphilis

Syphilis prevention is based on behavioral interventions, early diagnosis and early treatment. Sexual abstinence and mutual monogamy are effective in preventing the transmission. The use of condoms is much more effective at reducing the risk of transmission, but still some transmission can be possible via uncovered lesions.

Presumptive treatment should be administered to sexual partners who have been exposed to persons with primary, secondary, or early latent syphilis in the last 90 days (even when serological tests are negative).

2.7 Complications of Syphilis

Unattended syphilis may advance to serious systemic complications of the cardiovascular system, the nervous system, eyes, bones, and joints. One of the most severe consequences can be neurosyphilis that can lead to paralysis, dementia, blindness, or death. SSa right at birth, death of the child, and permanent disability.

III. METHODOLOGY

This chapter outlines the methodological strategy of analyzing the prevalence and the factors of syphilis in Kebbi State. The research used the logistic regression analysis to model the correlation between syphilis infection status and the explanatory variables chosen. The reason behind the selection of logistic regression is the fact that the outcome measure is a dichotomous variable and the approach is highly applicable to the epidemiological studies that involve dichotomous health variables.

3.1 Data Collection and Source

The research employed the secondary data, which is based on the retrospective submission of patient records in Sir Yahaya memorial hospital, Birnin Kebbi, Kebbi State. It was appropriate to use secondary data in this study because they are reliable and relevant in the determination of the prevalence of the disease and its factors. The sample size was 100 patient records, including syphilis tests outcomes and chosen demographic and clinical factors.

3.2 Logistic Regression Model

The binary logistic regression was used to test the relationship between syphilis infection and explanatory variables. The dependent was syphilis status that was coded as 1 infected and 0 not infected. Logistic regression estimates the likelihood of an event to occur depending on predictor variables and limits the likelihoods of events to [0,1].

Where Yidenote the status of i-th person with syphilis and where pi=P(Yi=1[?]Xi) is the probability of infection with a vector of predictors Xi. The logistic regression model is given as:

$$\text{logit}(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_k X_{ki}$$

Equivalently, the probability of syphilis infection is given by:

$$p_i = \frac{\exp\left(\beta_0 + \beta_1 X_{1i} + \cdots + \beta_k X_{ki}\right)}{1 + \exp\left(\beta_0 + \beta_1 X_{1i} + \cdots + \beta_k X_{ki}\right)}$$

where $\beta_0$is the intercept and $\beta_k$are regression coefficients measuring the effect of each predictor on the log odds of infection.

3.3 Model Assumptions and Sample Size Considerations

The logistic regression model proposes that there is binary dependent variable, the observations are independent, that the predictors are not multicollinear, and that the linear relationship is linear between the predictors that are continuous and the logit of the outcome variable. These were assumptions, which were made before model estimation.

The sufficiency of the sample size was informed by the following rule suggested by Peduzzi et al. (1996): at least ten outcome events per predictor variable that was formulated as:

$$N = \frac{10k}{p}$$

and where k is the number of predictors and pis the lesser proportion of positive or negative cases. A sample size of 100 observations was used in line with

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the stipulations made by Long (1997) in ensuring that the parameter estimates were more stable.

3.4 Parameter Estimation

The Maximum Likelihood Estimation (MLE) was used to estimate model parameters. In the case of independent observations, the likelihood of the logistic regression model takes the form:

$$L(\beta) = \prod_{i=1}^{n} p_i^{Y_i} (1 - p_i)^{1-Y_i}$$

Taking the natural logarithm yields the log-likelihood function:

$$\ell(\beta) = \sum_{i=1}^{n} [Y_i \ln (p_i) + (1 - Y_i) \ln (1 - p_i)]$$

The log-likelihood function is maximized with an iterative numerical procedure to be used to obtain the maximum likelihood estimates of the regression coefficients.

3.5 Statistical Inference

The Wald test was used to test the statistical significance of individual regression coefficients. The Wald statistic of the coefficient is provided as:

$$Z = \frac{\hat{\beta}}{\text{SE}(\hat{\beta})}$$

where $\hat{\beta}$is the estimated coefficient and SE($\hat{\beta}$)is its standard error. The square of this statistic follows a chi-square distribution with one degree of freedom. While the Wald test is widely used, its limitations in small samples were acknowledged.

3.6 Likelihood Ratio Test

b is the estimated coefficient and standard error of the coefficient is denoted as SE(b). The square of this statistic is distributed as chi-square statistic with one degree of freedom. Although it is very common, its weaknesses in small samples were realized.

3.6 Likelihood Ratio Test

The overall significance of the model, as well as the contribution of predictors, were evaluated with the help of Likelihood Ratio Tests (LRTs). The LRT measures the probability of the null model against fitted model and is given as:

$$G = -2(\ln L_0 - \ln L_1)$$

And L0is the probability of the null model and L1is the probability of the fitted model. The test statistic is distributed under chi-square with the difference in the number of parameters in the two models as the degrees of freedom of the test statistic. A statistically significant outcome shows that the predictors are all combined in explaining syphilis infection.

All statistical operations were performed in Statistical Package of the Social Sciences (SPSS), version 16.0 and the statistical significance was evaluated at 5 percentage.

IV. DATA ANALYSIS AND DESCRIPTION

This chapter gives the analysis and interpretation of data utilized to research the factors related to syphilis infection in Kebbi State. It will be analyzed using secondary data gathered in retrospectively, using hospital records. The study population is summarized using descriptive statistics and then it would be followed by binary logistic regression to determine the significant predictors of syphilis infection. All the analyses were done by using SPSS.

4.1 Descriptive Statistics

Descriptive statistics provide the general description of the study sample and prepare the variables to be analyzed using logistic regression. The variables were coded i.e. syphilis status (1 = infected, 0 = non-infected), sex (1 = male, 0 = female), age (1 = 20 years and below, 2 = 21-35 years, 3 = 36 years and above) and tribe (0 = indigene, 1 = non- indigene).

Table 4.1.0: Summary Statistics

	SEX	AGE	RESULTS	TRIBE
N Valid	100	100	100	100
Missing	0	0	0	0

Table 4.1.1: Sex Distribution

SEX	Frequency	Percent	Valid Percent	Cumulative Percent
0 (Female)	38	38.0	38.0	38.0

1 (Male)	62	62.0	62.0	100.0
Total	100	100.0	100.0	

Table 4.1.2: Age Distribution

AGE	Frequency	Percent	Valid Percent	Cumulative Percent
1 (≤20)	46	46.0	46.0	46.0
2 (21–35)	29	29.0	29.0	75.0
3 (≥36)	25	25.0	25.0	100.0
Total	100	100.0	100.0	

Table 4.1.3: Syphilis Test Results

RESULTS	Frequency	Percent	Valid Percent	Cumulative Percent
0 (Negative)	38	38.0	38.0	38.0
1 (Positive)	62	62.0	62.0	100.0
Total	100	100.0	100.0	

Table 4.1.4: Tribe Distribution

TRIBE	Frequency	Percent	Valid Percent	Cumulative Percent
0 (Indigene)	65	65.0	65.0	65.0
1 (Non-Indigene)	35	35.0	35.0	100.0
Total	100	100.0	100.0	

4.2 Inferential Analysis

Binary logistic regression was conducted to assess the relationship between syphilis infection and the explanatory variables (sex, age, and tribe).

Table 4.2.1: Case Processing Summary

	N	Percent
Selected Cases - Included in Analysis	100	100.0
Missing Cases	0	0.0
Total	100	100.0

Table 4.2.2: Dependent Variable Encoding

Original Value	Internal Value
0	0
1	1

Table 4.2.3: Categorical Variable Coding

Variable	Value	Frequency	Parameter Coding
TRIBE	0	65	1.000
	1	35	0.000
SEX	0	38	1.000
	1	62	0.000

Block 0: Constant-Only Model

Block 0 represents the model with only the constant. The classification table indicates correct classification without predictors.

Table 4.2.5: Classification Table (Block 0)

Observed	Predicted	0	1	Percentage Correct
RESULTS	0	0	38	0.0
	1	0	62	100.0
Overall Percentage				62.0

Variables-not-in-the-equation table identifies tribe as a predictor with potential significance.

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Table 4.2.7: Variables Not in the Equation

Variable	Score	df	Sig.
SEX(1)	0.035	1	0.852
AGE	0.260	1	0.610
TRIBE(1)	4.121	1	0.042
Overall	5.209	3	0.157

Block 1: Model with Predictors
All predictors (sex, age, tribe) were entered.

Table 4.2.8: Omnibus Tests of Model Coefficients

Step	Chi-square	df	Sig.
Step 1	5.239	3	0.155
Block	5.239	3	0.155
Model	5.239	3	0.155

Table 4.2.9: Model Summary

Step	-2 Log Likelihood	Cox & Snell R^2	Nagelkerke R^2
1	127.574	0.051	0.069

Hosmer–Lemeshow test confirms good model fit:

Table 4.3: Hosmer-Lemeshow Test

Step	Chi-square	df	Sig.
1	3.394	8	0.907

Table 4.3.1: Hosmer-Lemeshow Contingency Table

Step	RESULTS=0 Observed	RESULTS=0 Expected	RESULTS=1 Observed	RESULTS=1 Expected	Total
1	1	4.330	5	3.670	9
2	4	3.684	3	3.316	7
3	5	4.055	3	3.945	8
4	5	4.930	6	6.070	11
5	10	8.807	15	16.193	25
6	3	4.017	9	7.983	12
7	3	2.032	4	4.968	7
8	2	1.921	5	5.079	7
9	1	2.116	8	6.884	9
10	1	1.107	4	3.893	5

Table 4.3.2: Classification Table (Step 1)

Observed	Predicted	0	1	Percentage Correct
RESULTS	0	13	25	34.2
	1	11	51	82.3
Overall Percentage				64.0

Table 4.3.3: Variables in the Equation (Step 1)

Variable	B	S.E.	Wald	df	Sig.	Exp(B)
SEX(1)	0.078	0.438	0.031	1	0.859	1.081
AGE	0.285	0.276	1.066	1	0.302	1.330
TRIBE(1)	1.000	0.455	4.819	1	0.028	2.717
Constant	-0.676	0.676	0.999	1	0.318	0.509

Interpretation: Only tribe was a statistically significant predictor ($p = 0.028$), with non-indigenes having 2.717 times higher odds of testing positive for syphilis compared to indigenes.

V. SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter is aimed at summarizing the whole study, make conclusion based on the results obtained; also appropriate findings of the study and recommendations based on the findings of the study are shown All necessary information mentioned are presented below.

5.1 SUMMARY

The main aim of this research is to use logistic regression model to analyze on factors Responsible for occurrence of syphilis and provide a means of reducing it, also the factors that are contributing to occurrence of syphilis base on gender, sex and tribe (Indigene or non-indigene) and the effect of Syphilis on Human life using logistic regression analysis to test the significant. Basic Introduction on syphilis, Statement of the Problem, Aims and Objectives of the research, Scope and Limitation on the research was done in the First Chapter. However, in the second

chapter, a review on origin of syphilis, Alternative names of syphilis, clinical manifestation, Diagnostic test, History of the treatment of syphilis, prevention and control of syphilis, and complications of syphilis were discussed and the collection of other relevant research works that provide basis for present research was also included. Review of related literatures in statistical research is often very times significant and very necessary due to its vast areas of applications. All the methodology used was being discussed in the Third Chapter. Analysis of data collected through retrospective study were been coded using SPSS and used to analyze the data using binary logistic regression, it was also used to assess the classification table, hosmer and lemeshow goodness of fit test, classification plot. Likelihood ratio test was done to check the significance of the predictors selected, Omnibus test was used to check the fitness of the model used in the analysis

5.2 CONCLUSION

The method used in this research work is logistic VI. regression model; the data used in the research were collected through retrospective study at Sir Yahaya Memorial Hospital in Kebbi State. Knowledge on the role of syphilis transmissions, cause and comprehensive knowledge about syphilis preventions strategies was observed to be among the study. The model indicates tribe (indigene and non indigene) contributes significantly to the effect of syphilis in human life in Kebbi State.

However it also indicates that factors such as age and sex are not good predictors in assessing the effect contributing to this infection in Kebbi State.

5.3 RECOMMENDATION

Syphilis is a systematic disease caused by Treponemal pallidum. The disease has been divided into stages based on clinical findings, helping to guide treatment and follow –up. Persons who have syphilis might seek treatment for signs or symptoms of Primary syphilis (i.e. ulcers or chancre at the infection site). Secondary syphilis (i.e. manifestation that includes, but is not limited to skin rashes mucocutaneous lesions and lymph denopathy) or tertiary syphilis (i.e. cardiac, gummatous lesions, tabes dorsails and general paresis). Latent syphilis acquired within the preceding year, in this Early neurological clinical manifestations are usually present within the first few month. Therefore results from this study recommended the following:

(1) Dissemination of information either by media or local means (traditional rulers or religious rulers) on the consistent use of latex condom as the effective means against the spread of syphilis through sexual contact.

(2) It also recommended to design or improve syphilis control programs and to identify indicators for program effectiveness in Kebbi State.

(3) It can also be incorporated into decision making processes, the design of sustainable intervention with active community participation and the implementation of educational scheme.

(4) This result also calls for targeted health education to increase the population comprehensive knowledge on effective syphilis control strategies in Birnin-Kebbi metropolis.

APPENDIX

Below is how the data was coded in the SPSS package for the study:

- Syphilis Status: 1 = patient with syphilis, 0 = patient without syphilis
- Age: 1 = 20 years and below, 2 = 21–35 years, 3 = 36 years and above
- Sex: 1 = Male, 0 = Female
- Tribe: 1 = Non-Indigene, 0 = Indigene

SEX	AGE	RESULT	TRIBE
0.0	1.0	0.0	0.0
1.0	1.0	1.0	0.0
1.0	1.0	1.0	0.0
1.0	1.0	1.0	0.0
1.0	1.0	1.0	0.0
1.0	1.0	1.0	0.0
1.0	2.0	1.0	0.0
1.0	2.0	1.0	1.0
1.0	2.0	1.0	1.0
0.0	2.0	1.0	0.0
1.0	2.0	1.0	0.0
1.0	3.0	1.0	0.0
0.0	1.0	1.0	0.0
1.0	1.0	0.0	0.0
0.0	1.0	0.0	0.0
1.0	3.0	1.0	0.0

1.0	3.0	1.0	0.0
0.0	1.0	1.0	0.0
0.0	1.0	1.0	0.0
1.0	1.0	0.0	0.0
1.0	2.0	1.0	0.0
1.0	1.0	1.0	0.0
1.0	1.0	0.0	0.0
1.0	1.0	0.0	0.0
1.0	1.0	0.0	0.0
1.0	1.0	1.0	0.0
1.0	1.0	1.0	0.0
0.0	3.0	1.0	0.0
1.0	1.0	1.0	0.0
0.0	2.0	0.0	0.0
...	...	...	...

Note: The table above shows a partial extract. The complete dataset includes all 100 cases used in the analysis, coded consistently according to the variables described. Each row represents an individual patient's data used in SPSS for logistic regression analysis.

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