

An Assessment Of The Prevalence Of Hepatitis B, C & HIV Infection Status Among Dental Out Patients At Neigrihms Two-Year Data Comparative Study.

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Background: Viral hepatitis B and C, as well as HIV infection, are like endemic diseases across the globe, and the spread of these illnesses is a major health concern, especially among developing nations. The most important aspect about this is that, the majority of the population (in developing countries) does not know how this disease gets transmitted and how severe its consequences can be if it persists forever. It's likely that they are only aware of the source of infection, such as repeated blood transfusions or needle exchanges among drug users, which are the main reason for the spread of blood borne diseases. But it has been found that apart from the above mentioned sources of infection, there are some trivial issues where most of the population are not aware and even ignore by the most of the health care professionals. So this slight amount of negligence might cause a risk of transmission and acquisition of these diseases in a profession especially like dentistry after any form of a dental procedure's unless mandatory screening of every patient for hepatitis B, C and HIV were not done. Besides that proper sterilization of any dental instrument after any form dental procedure, including Oral examination set is not maintained. Since from our data it has been come to our notice that some of the patient who had attended our dental OPD for any form of dental treatment had shown HBV & HCV including HIV test reactive or positive after mandatory screening of every patient before any dental procedure except paediatrics patient.

AIM: The aim of the present paper is to acknowledge the prevalence rate of hepatitis B, C as well as HIV infection status among the dental OPD patients of North-East India, who had attended dental OPD at Neigrihms hospital during the two-years of study.

Method: It's a prospective comparative study where a data was collected from dental OPD patient who was recorded in between January 2018 to December 2020. In this study OPD patients were asked to go for mandatory screening of hepatitis B, C as well and HIV before any dental procedure except paediatric patients.

Result: The result from a data shows that nine Nos. Of dental OPD patients was infected with hepatitis B, C including HIV out of 27932 total Nos of OPD patients. Where five was shown with HBsAg: positive, three was shown with Anti-HCV: test positive and one was infected with, HIV. The total Nos of patients were comprised of new cases, follow-up cases, In-patient cases, referred cases which was recorded in between January 2018 to December 2020. The prevalence rate was 0.032 % for overall cases, 0.018 % for HBsAg: positive cases, 0.011% for Anti-HCV: positive cases and 0.004% for HIV positive cases.

Key words: Prevalence of HBV, HCV & HIV, Dental patient, risk.

Conclusion: From this data, an overall prevalence rate of hepatitis B, C including HIV seems to be very negligible in amounts of the concerned disease that are prevalent among dental OPD patients during the given period of an assessment. But these meagre numbers of infected patients in dentistry will also remain accountable in terms of risk factor. Since any infected individuals will carry equal amount of risk potentiality for transmission of diseases to other dental patient as well as to the DHCW during any form of a dental procedures if strict sterilization or mandatory screening of every individual patients are not maintained before any dental procedure.

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I. Introductions:

Viral hepatitis is the most common cause of liver diseases and it's a major public health issue, occurring endemically in all part of the world. There are more than 2 billion people worldwide having evidence of recent or past HBV infection and 350 million are chronic carrier [1]. In the southeast Asia region there are estimated to be 80 million HBV carriers (about 6% of the total population) [2]. India has the intermediate endemic city of hepatitis B, with hepatitis B surface antigen prevalence between 2% and 10 % among the population studied. The number of carriers in India has been estimated to over 40 million [3]. HBV and HCV are

common causes of occupational diseases transmitted from patient to health care workers (HCW) and *vice versa* and also to HCW families[4]. It has been estimated that 14.4% and 1.4 % of hospital workers are infected with HBV and HVC respectively [5]. Physician, dentist, nurses' laboratory staff and dialysis centre personnel are at high risk of acquiring infection. Other studies also shows that nurses were most commonly exposed to infection (41%) followed by physician (31%) among health care worker [6].But according study conducted by [7] in Japan the frequency of exposure to HBV was the highest among dental health care workers. Vectors of infection with HBV in dental practice include blood, saliva and nasopharyngeal secretion [8]. Intraorally the greatest concentration of hepatitis infection is in gingival sulcus as per their study [9]. Most HCV patients (77%) had higher HCV RNA levels in their gingival sulcus than in their saliva [10]. There are some studies in which they had demonstrated that a contamination with HCV-RNA of a considerable portion of tooth brushes used by hepatitis C patients [11]. So from their studies, it shows that Dental Health Care Worker (DHCW) are much more venerable than any other health care profession in terms of viral hepatitis B & C disease acquisition, as they are constantly in direct contact with oral cavity and gingival fluids during any form of dental procedure. The aim of the present paper is to acknowledge the clinical implication of saliva and gingival fluid including dental instrument could be the source of transmission for viral hepatitis among different individuals in dental patient if there is lapse in screening of every dental patient and improper sterilization of dental instrument that are not maintained properly before and after any dental procedure.

II. Materials And Methods:

This is a comparative study, to assess the prevalence rate of hepatitis B & C including HIV infection status among dental OPD patient during the period from-January 2018 to December 2020. The data was obtained from daily OPD attendance register, Department of Dentistry NEIGRIHMS, which was recorded on daily basis during normal working days. No criteria for inclusion or exclusion as well as consent form for the subject unlike interventional study. So for the study it included all the subjects who have to go for any form of dental procedure, for mandatory screening of hepatitis B and C including HIV, except paediatric and other immune compromised patients. The subject were comprises of daily new patients, followed-up patients, In-patients and referred patients from other department, that are categorised into different columns as shown in table No.1. The screening was done before the initiation of any dental procedure. The entire tests were done at NEIGRIHMS department of microbiology as shown in appendix section of this page.

TABLE NO. 1. DATA SHOWS NUMBER OF DENTAL OPD PATIENTS DURING A YEAR FROM JANUARY 2018 TO DECEMBER 2020. THE DATA ARE COMPRISES OF: NEW PATIENTS, FOLLOW-UP PATIENTS, IN-PATIENTS CASES OF YEAR JANUARY 2018 TO DECEMBER 2020.

MONTH & YEARS	NO. OF OPD PATIENTS/MONTH		NO.OF IN-PATIENT/ MONTH	REFERED PATIENTS FROM OTHER DEPARTMEN T/MONTH	NO.OF MALE & FEMALE PATIENTS / MONTH		TOTAL NO.OF PATIENTS/ MONTH
	NO.OF NEW PATIENT/M ONTH	NOS.OF FOLLOW-UP PATIENT/MO NTH			M	F	
JANUARY -2018	325	325	12	28	321	369	690
FEBRUARY - 2018	241	353	04	32	340	290	630
MARCH-2018	315	546	08	47	457	459	916
APRIL-2018	323	609	08	43	492	491	983
MAY-2018	539	594	07	73	591	622	1213
JUNE -2018	476	508	06	69	543	516	1059
JULY-2018	627	641	05	52	723	602	1325
AUGUST-2018	500	604	08	51	589	574	1163
SEPTEMBER- 2018	497	548	08	51	531	573	1104
OCTOBER-2018	378	443	21	44	418	468	886
NOVEMBER- 2018	224	682	09	56	473	498	971
DECEMBER- 2018	226	486	12	29	334	419	753
TOTAL	4671	6339	108	575	5812	5881	11693
JANUARY -2019	216	581	13	38	433	415	848
FEBRUARY - 2019	172	635	09	10	411	415	826
MARCH-2019	277	767	14	02	501	559	1060
APRIL-2019	256	825	10	12	524	579	1103

An Assessment Of The Prevalence Of Hepatitis B, C & HIV Infection Status Among ..

MAY-2019	253	934	07	00	592	602	1194
JUNE -2019	274	847	04	17	570	572	1142
JULY-2019	307	1071	04	07	706	683	1389
AUGUST-2019	246	951	17	05	620	599	1219
SEPTEMBER-2019	235	795	02	01	510	523	1033
OCTOBER-2019	204	793	07	00	497	507	1004
NOVEMBER-2019	185	740	05	01	464	467	931
DECEMBER-2019	136	583	05	00	388	336	724
TOTAL	2761	9522	97	93	6216	6257	12473
JANUARY -2020	185	672	06	00	390	473	863
FEBRUARY -2020	176	632	02	03	389	424	813
MARCH-2020	106	459	09	01	237	338	575
APRIL-2020	56	50	01	00	64	43	107
MAY-2020	60	105	00	00	82	83	165
JUNE -2020	73	145	06	01	123	102	225
JULY-2020	08	04	01	00	06	07	13
AUGUST-2020	06	19	06	00	16	15	31
SEPTEMBER-2020	18	76	08	00	46	56	102
OCTOBER-2020	27	176	11	02	105	111	216
NOVEMBER-2020	43	248	18	00	182	127	309
DECEMBER-2020	46	289	06	06	173	174	347
TOTAL	804	2875	74	13	1813	1953	3766
GRAND TOTAL	8236	18736	279	681	13841	14091	27932

TABLE NO.02. DATA SHOWS NOS. OF HEPATITIS B & C INCLUDING HIV POSITIVE CASES ATTENDED DENTAL OPD DURING THE YEAR FROM JANURAY 2018 TO DECEMBER 2020.

SL No	DATE & YEAR	AGE	SEX	TYPE OF PATIENT	OCCUPATION	STATUS OF THE TEST
1	06.09.2018	17	M	OPD	STUDENT	Anti-HCV: POSITIVE
2	30.03.2019	60	M	OPD	NA	HBs Ag :POSITIVE
3	24.05.2019	43	M	OPD	NA	Anti-HCV :POSITIVE
4	12.06.2019	41	F	OPD	NA	HBs Ag :POSITIVE
5	01.07.2019	40	F	OPD	NA	Anti-HCV :POSITIVE
6	23.01.2020	28	F	OPD	HOUSE WIFE	(R/NR) FOR HIV-1 antibodies reactive in :Miniscreen & tredus... test
7	07.02.2020	27	M	OPD	NA	HBs Ag :POSITIVE
8	16.10. 2020	34	M	OPD	NA	HBs Ag :POSITIVE
9	28.11.2020	17	M	OPD	STUDENT	

TABLE NO.04. PREVALENCE RATE OF HEPATITIS B, C & HIV DURING A YEAR FROM JANURAY 2018 TO DECEMBER 2020 AT NEIGRIHMS DENTAL OPD.

	TOTAL NOS.OF OPD PATIENTS	HEPATITIS B ,C & HIV CASES	NON-CASES	PREVALENCE RATE
TOTAL	27932	9	27923	0.032%
NOS. OF HBsAg :POSITIVE CASES	27932	5	27927	0.018%
NOS. OF CASES ANTI-HCV :POSITIVE	27932	3	27929	0.011%
NOS. OF HIV CASES	27932	1	27931	0.004%.

TABLE NO.05.PPREVALENCE RATE OF HEPATITIS B, C & HIV IN MALE AND FEMALE PATIENTS DURING A YEAR FROM JANURAY 2018 TO DECEMBER 2020.

DURATIO N: 2 years From:	TOTAL NO OF OPD MALE &	NON- CASES HEPATITIS B ,C & HIV : IN MALE & FEMALE PATIENTS			HEPATITIS B ,C & HIV :POSITIVE CASES IN MALE & FEMALE PATIENTS		
		HBsAg :POSITIVE	ANTI-HCV :POSITIVE	HIV	HBsAg :POSITIVE	ANTI-HCV :POSITIVE	HIV CASES

January 2018 to December 2020	FEMALE CASES		CASES IN		CASES IN		CASES IN		CASES IN		CASES IN		IN	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
	1384	1409	1383	1409	1383	1409	1384	1409	4	1	2	1	0	1
1	1	7	0	9	0	1	0							
PREVALENCE RATE									0.03	0.07	0.014	0.07	0%	0.07
									%	%	%	%		%

III. Result

RESULT: From this data it has been found that nine patients were found to be reactive for hepatitis B & C as well as for HIV test, of which five patients had shown HBsAg test reactive, three patients with Anti-HCV reactive and one patient with HIV test reactive. An overall prevalence rate of hepatitis B, C including HIV during year of January 2018 to December 2020 at Neigrihms dental OPD patients was 0.32 %. Prevalence rates of HBs Ag positive was 0.012%, similarly for Anti-HCV positive cases was 0.011% and for HIV positive cases was 0.004% as shown in table No.04. As per the diseases prevalence among male and female OPD patients, an HBsAg positive case was found to be prevalent more among male patient with total Nos. Of four cases with a prevalence rate of 0.03%, were as none of them had detected positive with HIV test except one female OPD patient was detected with HIV positive with prevalence rate of 0.004% during the course of this study. In contrary to that, female OPD patients were found to be more prevalent with Anti-HCV positive cases with total Nos. of two in cases and prevalence rate was found to be 0.014% as shown in table No.05. The above study was compiled from the data obtained from dental OPD patients at NEIGRIHMS during a year of January 2018 to December 2020. The total Nos. Of OPD patients who had attended a dental OPD was around 27932 including paediatric dental patient. The total Nos. Of patients were comprises of 8236 new cases, 18736 follow-up cases, 297 In-patient cases, 681 referred cases, 13841 male cases and 14091 female cases as shown in table No 1. From the data it has come to our notice that the prevalence rate of hepatitis B,C as well as HIV was found to be negligible in percentage as compare to the total numbers of none reactive patients but we can interpret that, this asymptomatic patients will keep on visiting dental OPD without our knowledge, unless we consider the screening test as compulsory before any dental procedure this what we found during the assessment, and those patient who had tested positive for respective diseases were asymptomatic. So in this connection the study says that DHCW are always at risk during any dental procedure. Even from their study also [10] & [11] says that a tooth brush and GCF fluid could be the source of the transmission for hepatitis B & C infection within dental patients. Since even today most of the dental clinic or dental set-up does not consider screening of hepatitis B & C including HIV as mandatory before any dental procedure which could be anyone of the reason like lack of awareness, accessibility or an economic burden to a patients.

AN ASSOCIATION OF ORAL CAVITY WITH HEPATITIS C INFECTION

There are some study says that the prevalence of OLP (Oral lichen planus) and pitted keratolysis in the HBsAg carrier group has been found to be significantly higher [12]. However, HBsAg positivity may induce or cause proneness to OLP and pitted keratolysis with some mechanism that need to be elucidated [12]. There are some studies in which they have also reported and suggested that a positive correlation between the prevalence of hepatitis C and OLP, but some of them still remain controversial [13-16]. A recent case report suggests that a correlation between the drugs and interferon used for the treatment of hepatitis C could be the cause for extra hepatic manifestation such as OLP [17]. There are some studies in which they have also reported that some patients are presenting with a triple association of HCV infection; Sjögren's syndrome and sialadenitis or salivary gland lymphoma [18]. There are also some study in which they have reported that 20-30% of patients with HCV infection have Sicca symptoms of either the mouth or eyes, where as less than 5% of the patients with Sjögren's syndrome are HCV positive [19].

IV. Discussions:

Viral hepatitis B, C and HIV carriers are difficult to segregate from usual patient for any health care worker, unless the patients shows some sign and symptoms or patients itself reveals it especially asymptomatic cases. Or the reasons could be due to unaware about their sign and symptom or like, many a times insignificant exposure to HBV & HCV are ignore or unappreciated, unless it followed with sign and symptom after an exposure, and it's also true that most of time a carrier go unrecognized. This could be due to lack of an awareness of the consequences regarding the infection or economic burden or unavailability of vaccine especially in developing or underdeveloped countries which are yet to be ascertain. Most importantly people are not aware about the prevalence of the infection which is already present in the population almost like an endemic. More importantly even today most of the DHCW might not be vaccinated before they are inducted into this kind of professions unlike developed countries. Another reason might be due to lack of adequate

training regarding the handling or the use of dental instruments including post exposure protocols which are to be followed. In most of the cases in dental OPD, patient remained unscreened before any dental procedure for some trivial issue which should be considered seriously. So with regards to that, there is some study in which they have reported that, they have found fifteen cases of hepatitis B in hospital workers employed more than two years when only three recalled an exposure. Post exposure HBIG is inadequate to prevent HBV disease because many exposures are unnoticed. [20]. It is also said that HBsAg can be found in the saliva of individuals who have HBsAg in their plasma but, no substantial data are available to implicate saliva or body fluids as major vehicles. In fact there are some studies who suggested that saliva is not an effective vehicle of transmission in a natural or experimental setting but may function as a vehicle if inoculated parenterally [21, 22]. As per CDC recommendations for infection-control practice in dentistry, infection may be transmitted in dental operatory through several routes, including direct contact with blood, oral fluids, or other secretions; indirect contact with contaminated instruments, operatory equipments or environmental surfaces [23]. As per them [24] most of the HVC infected individuals (60% -70 %) remain asymptomatic a individuals can only recognised a infection if a chronic state is reached or presenting elevated risk of cirrhosis, hepatocellular carcinoma and death[25]. Most of a dental procedures is always carried out with instrument only either it's a rotary or hand, including simple oral examination. So instruments dependent procedure always carry a risk of contamination by blood or saliva mainly aerosol generating instruments. As per them [8] vectors of infection with HBV in dental practice include blood saliva and nasopharyngeal secretion. There are some study who had reported that HBV and HCV can persist in various environment and plaster cast for more than one day and one week. [26, 27]. It has also been found that HBV and HCV exist on various surfaces in the dental operatory even many days after treating patients positive with hepatitis B and C [28]. More over HCV can remain stable at room temperature for over 5 days as per their study [29]. Some study also suggested that HCV can remain infectious after drying and exposure to air at room temperature for at least 16 hours, the inanimate surfaces objects, and appliances might act as fomites for HCV transmission in dental operatory room [30]. There was also a comparative study between dental equipment and endoscope in term of its infectivity with hepatitis B, in which their study result shows that 2% of instruments used for dental treatment were infected with hepatitis B virus. Only one sample was positive for HBsAg among 50 specimens of endoscope instrument [31]. From their study it has come into their conclusion that there might exist the possibility of HBV transmission through dental equipments and endoscope instruments. There are also some studies in which they have also reported that medical devices such as dental instruments and endoscopes have also been associated with HBV transmission [32][33].

V. Conclusion:

A blood borne virus hepatitis B and C as well as HIV diseases are of extreme concerned now days to any form of health care provider especially to dental professionals. "Since most of an asymptomatic cases or carrier remains unnoticed unless we mandate patients for routine screening before any dental procedure" which has been observed in our study. As we all know in dentistry most of the dental instruments which we used for day to day dental procedure are contaminated with both saliva as well as GCF fluids. As per their study, the most significant concentration of virus in viral hepatitis infection is in gingival sulcus intraorally [9]. There is also some study who says that, most HCV patients (77%) had higher HCV RNA levels in their gingival sulcus than in their saliva [10]. Another group of study also demonstrated that contamination with HCV-RNA of a considerable portion of tooth brushes used by hepatitis C patients [11]. As per them [34] they had also said that, HBV infection is the most important infectious occupational hazard in the dental profession which has significantly higher incidence of HBV in dental staff as well as to oral surgeon, periodontist and to endodontist. So from our prospective data assessment as well as from different studies it can be concluded that, every dental OPD patients need to be mandatory screening for hepatitis B & C including HIV before any form of dental procedure followed by strict sterilization of all dental instruments before and after dental procedures. Since within these two periods of our assessment, it has been found that, the prevalence rate of hepatitis B, C as well as HIV infection status among dental OPD patients were found to be in-significant in numbers as comparers to non- infective cases among dental OPD patient but it has been found that, the patients who had infected with hepatitis B, C and HIV were asymptomatic. So considering a present prevalence rate of a hepatitis B,C and HIV infection status among dental OPD patients at present scenario with regards to asymptomatic as well presence of significant amount of hepatitis B and C in saliva and GCF of infected patients as per some studies. So as to restraint and to impede the propagation of the present endemic diseases that are presently prevalent among the different individual, within the patient as well as to the DHCW, we need to be more cautious about the present alarming status of the situations' and do mandatory screening of every individuals patients before any dental procedure followed by proper sterilization of all the instrument before and after any form of dental procedure. Apart from that we are also very much in needs of more of a study, particularly in this topic to come out for a proper solution whether a saliva or a GCF fluid really could acts as a source for transmission of these

asymptomatic diseases within the patient as well as to the DHCW, since every dental procedure involves contamination of dental instruments either by GCF fluid or saliva

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APPENDIX I
A TEST REPORT OF THE PATIENT

06/09/2018
NORTH EASTERN INDIRA GANDHI REGIONAL INSTITUTE OF HEALTH AND MEDICAL SCIENCES, SHILLONG
DEPARTMENT OF MICROBIOLOGY

25
Name of Patient: [Redacted] Age/Sex: M/F CR. No.: 74583
Address: Shillong IP. No.:
Deptt./Unit: Dental OPD/Ward: Bed No.:
Requested by: [Redacted]
Provisional diagnosis:
Antimicrobials administered & duration:
Type of specimen:
Date & Time of collection:
Investigation required: HBsAg, Anti-HCV
Any previous report:
N.B.: Other than serological tests, kindly use a single investigation form for an individual test
Samples with incomplete/ineligible forms will not be accepted.

(Report overleaf)

Signature of Clinician
Date:

(For Lab. Use Only)

Date & time of receipt of specimen: Lab No.: 8536

HBsAg Negative/Reactive
Anti-HCV Non-Reactive/Reactive

Anti-HCV - Allevia Test kit Lot No NO-19173

Lab. Tech. [Signature] 06/09/18
Resident: [Signature]
Consultant: [Signature]

Date & time of dispatch:

LAB REPORT
(For Lab. Use Only)

Date & time of receipt of specimen: Lab No.: 8536

HBsAg Negative/Reactive
Anti-HCV Non-Reactive/Reactive

Anti-HCV - Allevia Test kit Lot No NO-19173

Lab. Tech. [Signature] 06/09/18
Resident: [Signature]
Consultant: [Signature]

Date & time of dispatch:

LAB REPORT
(For Lab. Use Only)

Date & time of receipt of specimen: Lab No.: 8536

HBsAg Negative/Reactive
Anti-HCV Non-Reactive/Reactive

Anti-HCV - Allevia Test kit Lot No NO-19173

Lab. Tech. [Signature] 06/09/18
Resident: [Signature]
Consultant: [Signature]

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HBsAg Negative/Reactive
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HBsAg - Allevia Test kit Lot No NO-19173

Lab. Tech. [Signature] 06/09/18
Resident: [Signature]
Consultant: [Signature]

Date & time of dispatch:

LAB REPORT
(For Lab. Use Only)

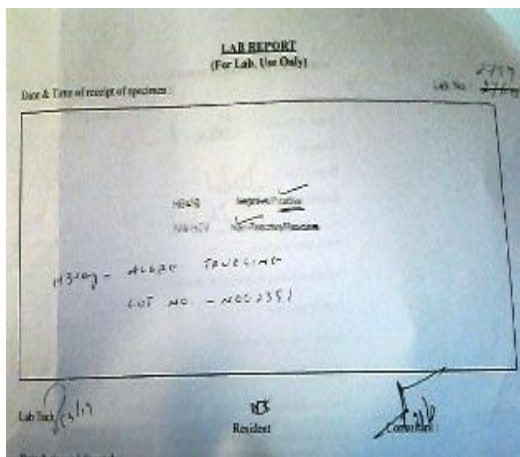
Date & time of receipt of specimen: Lab No.: 8536

HBsAg Negative/Reactive
Anti-HCV Non-Reactive/Reactive

Anti-HCV - Allevia Test kit Lot No NO-19173

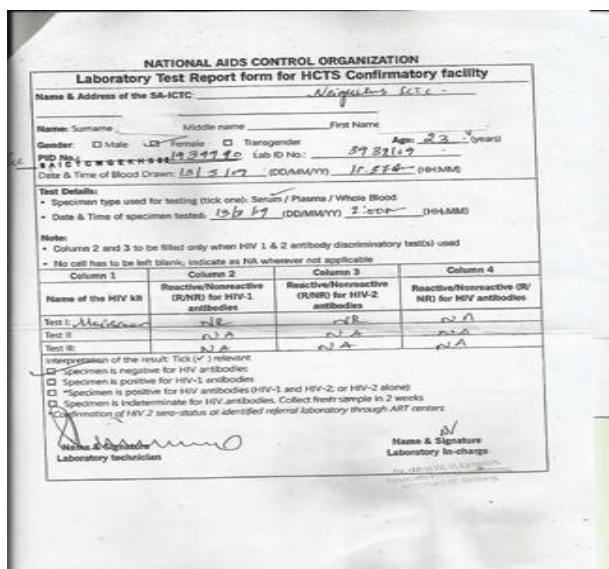
Lab. Tech. [Signature] 06/09/18
Resident: [Signature]
Consultant: [Signature]

Date & time of dispatch:



APPENDIX II
NATIONAL AIDS CONTROL ORGANIZATION
Laboratory Test Report form for HCTS confirmatory facility
Name & address of the SA-ICTC: NEIGRIHMS ICTC

SL No.	YEA R	AGE	SEX	TYPE OF PATIENT	TYPE OF TEST DONE				TOTAL NO. OF PATIENT
					COLUMN -1	COLUMN -2	COLUMN-3	COLUMN-4	
1	2020	28	F	OPD	Name of HIV KIT	Reactive/ Non-reactive (R/NR) for HIV-1 Antibodies	Reactive/ Non-reactive (R/NR) for HIV-2 Antibodies	Reactive/ Non-reactive (R/NR) for HIV for Antibodies	1
					TEST I: Comb AIDS	NA	NA	REACTIVE	
					TEST II: MERISCREEN	REACTIVE	NR	REACTIVE	
					TEST III: TREDRO	REACTIVE	NR	REACTIVE	



Dr. Lomtu Ronrang (MDS). "An Assessment Of The Prevalence Of Hepatitis B, C & HIV Infection Status Among Dental Out Patients At Neigrhms Two-Year Data Comparative Study." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(07), 2021, pp. 17-24.