

## ORIGINAL ARTICLE

**Utilization of Diagnostic Facilities In Non-government Medical College Hospital: A study on HFRCMCH**Khwaja Shajed Anwar<sup>1</sup>, AKM Salah Uddin<sup>2</sup>**Abstract:**

A retrospective study was done to evaluate the availability of medical investigation facilities in Holy Family Red Crescent Medical College Hospital (HFRCMCH) for a period of 6 months. The study was designed to find out the gaps in the study Institute which is a tertiary level hospital in Dhaka city. Data was collected from medical records by check list and interview schedule. Out of 49687 patients, 85.28% received services from out patient department and 14.72% from in patient department. Among them, 26151 cases were referred for investigation from out patient and inpatient departments. Out of those 24.36% were blood for routine examination, 17.72% urine for routine examination and 10.77% blood urea and 24.46% blood sugar, 3.82% stool for routine examination and 18.87% for radiological investigation of chest. In the inpatient department, routine examination of blood was highest (25.38%), next was blood sugar (23.01%). Some specific investigation namely S. Creatinin, S. Electrolytes, Liver function tests, VDRL, widal test, Blood grouping, Culture & sensitivity test were done. Out of specific tests, Blood grouping was highest followed by serum electrolytes. Majority of doctors (86.67) expressed satisfaction in regard to availability of Reagent and Films. Most doctors (93.33) expressed satisfactions in regard to result of laboratory tests and imaging. Regarding the skill of laboratory technician, 43.33% doctors opined good and 56.67% opined as moderate. The results of the study might help the administrator and planner to take steps for further improvement and appropriate utilization of laboratory facilities. However, there is an urgent need for improvement and horizon of investigation facilities should be expanded.

**Introduction:**

Proper diagnosis is essential for proper treatment, other wise treatment becomes wastage of time, money and add more pain and suffering to the patients. Hence it is important and worthy to make adequate facilities for proper laboratory investigation of disease with a view to have proper diagnosis.

A laboratory plays a very vital role for diagnosis of disease and there by in the delivery of health care services. It is one of the essential and important part of the health facilitates. It is difficult to provide proper health care services without well organized laboratory facilities and well trained laboratory manpower.

Most of the diagnostic facilities are situated in city hospitals. Most of the patients in tertiary level hospitals are referred from various

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corner of the country with a view to get specialized and modern treatment.

Modern medical practices are mostly depended on proper investigation facilities. The laboratory services are providing much for the diagnosis of patient. Patient coming in a tertiary level hospital like Holy Family Red Crescent Hospital are finally treated with sophisticated and most modern medicare systems where investigation facilities improve the services. Planning for better medical and surgical care frequently depends upon the availability of quick, detail and expert laboratory diagnostic services. Among the many modern diagnostic techniques X-ray contributes to a large extent to give effective and accurate treatment. Medical services depend upon quick laboratory investigation facilities with accurate result.

However, correct diagnosis will ensure suitable treatment for patient and in many cases it could avoid repeated hospitalization thus reducing the cost of health care.

The main factors responsible for the inadequate utilization of pathological services may be due to poor supply of reagent, less supply of equipment eg. Radiological films. Hence it is important and worthy to make adequate facilities for proper laboratory investigation of disease available to the people through out the country.

Literally laboratory means a room or a group of rooms or even building, that is equipped with apparatus and reagents and frequently with various types of animal for the performance of tests and experiments in especially physiology, physics, chemistry and biology, the preparations and therapeutic chemical and so on<sup>1</sup>.

“A hospital is a resident establishment which provides short term and long term Medical care consisting of observational, diagnostic, therapeutic and rehabilitative services for persons suffering from or suspected to be suffering from a disease or injury and for parturients. It may or may not always provide services for ambulatory patients on an out patient basis” (WHO Expert committee, 1963)<sup>2</sup>.

In an era of intensive specialization prompting groups of Laboratory workers to separate one from another, a determined effort must be made to preserve unity in the laboratory. This unity can be achieved only if its necessity is realized equally well by pathologist, non medical scientists, technicians and other workers. A laboratory so unified can function happily and efficiently & become as it should be the “nerve centre” of the modern hospital<sup>3</sup>.

Clinical laboratories are defined by law as facilities for examining materials derived from the body for purpose of providing information on diagnosis, prevention or treatment of disease<sup>4</sup>.

Integration of hospital and public health laboratories is essential in developing countries. Separate emphasis on clinical or public health work narrows the scope of laboratory activities, whereas integration of both types of laboratory should prove beneficially broadening these activities. It is desirable to encourage attempts towards achieving the maximum possible integration<sup>5</sup>.

A national health service ought to be an integral part of a country. Economic and social for development of health laboratory service plays a key role in providing an efficient and effective national health service and is one of its most important division<sup>5</sup>.

The clinical laboratory is an essential component in the medical care system and laboratory information is necessary in many clinical decisions. There is no inherent conceptual reason why laboratory information should be used differently in the decision making process from the information collected by the physician himself. The laboratory can be considered an information system and the performance of the entire system depends upon the effectiveness of each of the sequential steps in the information generation process.

Optimization of laboratory utilization requires the identification of explicit criteria regarding when laboratory tests should be used and the development of methods to ensure that the resulting data are utilized properly<sup>4</sup>.

The effectiveness of health services depends on the availability and proper utilization skilled health personnel.

While health laboratory services are playing an increasingly important role in the various health field, there is a conspicuous shortage even absence of health laboratory personnel in many parts of the world. This shortage has forced many authorities to employ insufficiently qualified personal in responsible positions. Such a practice is dangerous and urgent consideration should be given to corrective measures that can be speedily applied<sup>6</sup>.

The study was done to observe the existing laboratory, radiological and imaging facilities in the study place, to find out the number of investigations done, to assess the need by the doctors for additional diagnostic facilities, and factors affecting investigation facilities.

### Materials and method:

It was a retrospective type of study on medical records and laboratory records of in-patient and out-patient department in Holy Family Red Crescent Medical College Hospital, Dhaka during the period of December 2001 to May 2002. Study was selected purposively due to the fact Holy Family Red Crescent Medical College Hospital is a tertiary level teaching hospital and had all conventional investigation facilities. Structured questionnaire was used for survey of opinion of working doctors, check lists for collection of information of investigation facilities and instruments

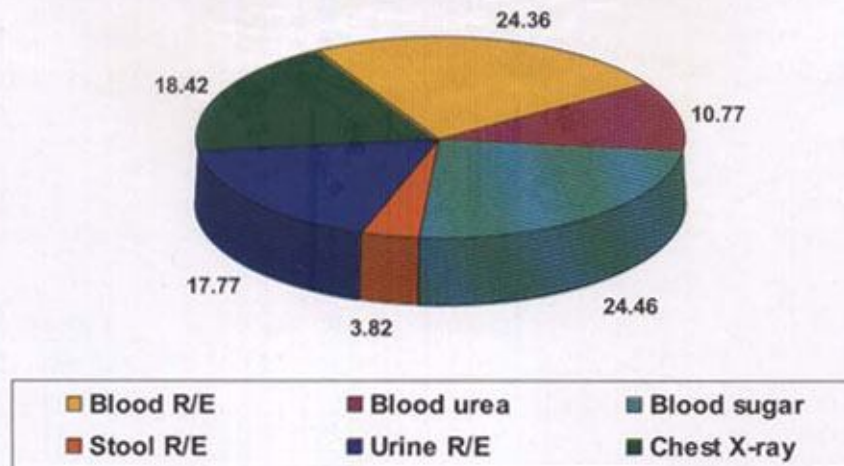
#### *Data collection techniques:*

1. Utilization of diagnostic facilities by review of records: The hospital records for the period of Dec.2001 to May 2002 were reviewed with a view to find number of patients admitted in indoor, the number of patients attended the outdoor and the number and types of investigations performed in the laboratories.
2. Status of laboratory and other investigation facilities: Check list was used to find out the existing diagnostic facilities, availability of laboratory instruments and reagent, X-ray machine and accessories were observed and documented by check list.
3. Interview of doctors: the doctors were interviewed face to face by the research with questionnaire.

The data were checked, verified, compiled and analyzed by using SPSS version 10.0 for consistency and were corrected accordingly. Frequency distribution, cross tabulation was done for the descriptive study. The important variables were taken into consideration and analyzed to fulfill the objectives of the study.

Results:

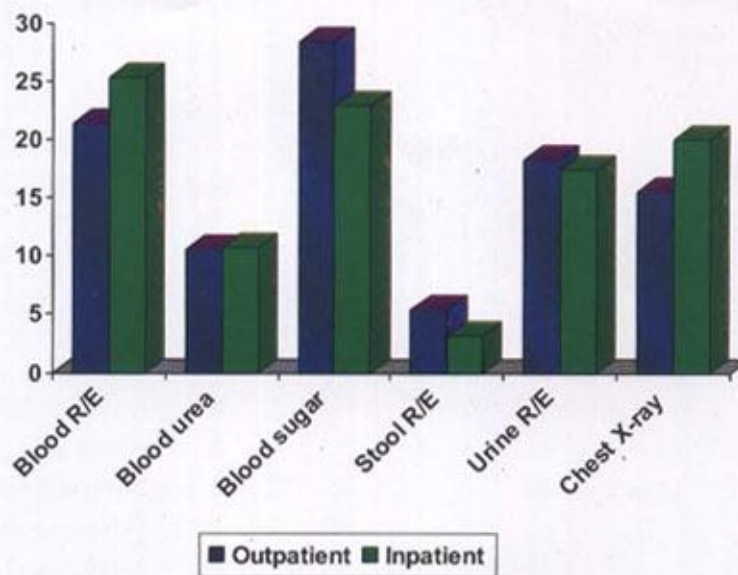
Figure-1: Distribution of investigation performed among all patients (n= 26151)



A total of 26151 cases were sent for both pathological and Radiological investigation during 6 month period. During that period both in outdoor and indoor a total of 24.36% (n=6371) cases were examined Blood for

Routine examination 10.77% (n=2817) Blood Urea, Blood sugar 24.46% (n=6396), Stool for R/E 3.82% (n=1000), Urine for R/E 17.72% (n=4635), chest X-ray 18.42% (n=4932).

Figure-2: Categories of investigation done through outpatient and inpatients



Among the total 6915 investigation, 21.50%(n=1487) were advised for Routine blood examination, Blood urea 10.65% (n=737), Blood sugar 28.53% (n=1973), Stool for R/E 5.47% (n=378) Urine for Routine examination 18.24(n=1264) and chest X-Rays 15.56% (n=1076).

Among the total patient admitted 25.4%(n=4884) were advised for blood for routine examination, 10.81% (n=2080) for Blood urea, 23.01% (n=4428) Blood sugar, 17.52% (n=3371) Urine for routine examination, 3.25% (n=622) Stool for routine examination and 20% (n=3856) for chest X-ray. Highest rate of advise was for blood test (25.4%) and lowest for stool examination (3.25%)

**Table-I:** Distribution of specific types of blood examination done

Category of investigation	Patient Investigation done	
	Number of patients	Percentage
ASO titre	338	02.64
Blood grouping	2817	21.99
S. billirubin	1944	15.17
S. Enzyme (S.G.OT /SGPT)	1167	09.11
S. Electrolytes	2591	20.22
Widal test	1104	08.61
HB <sub>s</sub> Ag	745	05.82
VDRL	899	07.02
S. Cholesterol	1206	09.41
Total	12811	100.00

The total patient attended in OPD IPD for Specific types of blood examination was 12811. Blood grouping was highest 21.99% & S. Electrolytes 20.22% next highest in order and the lowest was ASO titre 2.64% .

Patient for ASO titre 2.64% (n=338) were investigated, for grouping 21.99% (n=2817), S. Billirubin 15.17% (n=1944), Serum Enzymes (SGOT/SGPT),9.11% (n=1167),S Electrolytes 20.22%(n=2591), Widal test 8.61% (n=1104), HB<sub>s</sub> Ag 5.82% (n=745), VDRL 7.02%(n=899), S. Cholesterol 9.41% (n=1206).

**Table-II:** Distribution of different types of culture & Sensitivity test done through OPD and IPD

Category of investigation	Patient Investigation	
	Number of patients	Percentage
Blood Culture	2361	65.9
Sputum for C/S	636	17.8
Sputum for AFB smear	183	5.1
Urine for C/S	400	11.2
Total	3580	100.0

Table shows total test were 3580, out of which blood culture had the highest 65.9% and sputum for C/S 17.8% for & AFB smear 5.1% & urine for C/S 11.2%

**Table-III:** Distribution of other specific investigation done through OPD and IPD

Types of special investigation	Patient Investigation	
	Number of patients	Percentage
Pregnancy test	110	40.6
Myco dot test	76	28.0
Occult blood test	85	31.4
Total	271	100.0

Table shows that total number of Pregnancy test was 40.6% (n=110), Mycodot test 28.0% (n=76) & occult blood test 31.4% (n=85) in IPD & OPD. Highest numbers of specific test were advised for pregnancy test.

**Table-IV:** Doctors opinion for required Investigation done in OPD

Investigation done	Number of patients	Percentage
Yes	28	93.33
No	2	6.67
Total	30	100.0

It was observed that majority (93.33%) of the respondents said that routine investigation was done and required investigation not done was stated by only 6.67% .

**Table-V:** Doctors opinion for required investigation done in IPD.

Investigation done	Number of patients	Percentage
Yes	14	46.67
No	16	53.33
Total	30	100.0

It was observed that (46.67%) respondents said that routine investigation was done and required investigation not done was stated by (53.33%).

**Table-VI:** Doctors opinion about the skill of laboratory technicians

Skill	Number of doctors	Percentage
Good	13	43.33
Moderate	17	56.67
Poor	Nil	Nil
Total	30	100.0

About the skill of laboratory technicians 56.67% (n=17) of respondents, gave their opinion as moderates, 43.33% (n=13) as good and no one in the poor category.

**Table-VII:** Doctor's opinion on existing investigation facilities

Investigation facilities	Number of doctors	Percentage
Sufficient	14	46.67
Insufficient	16	53.33
Total	30	100.0

According to the table (46.67%) Doctors gave their opinion that existing investigation facilities sufficient and (53.33%) said that existing investigation facilities insufficient.

**Table-VIII:** Doctors perception regarding necessity of routine investigation done for indoor patients

Routine investigation for indoor patient	Number of doctors	Percentage
Necessary	23	76.67
Not necessary	7	23.33
Total	30	100.0

It was observed that 76.67% respondents said routine investigation of every indoor patient was done and 23.33% respondents gave opinion that investigation of every patient was not done.

Results:

Figure-3: Doctors opinion about the requirement of investigation need to improve patient care

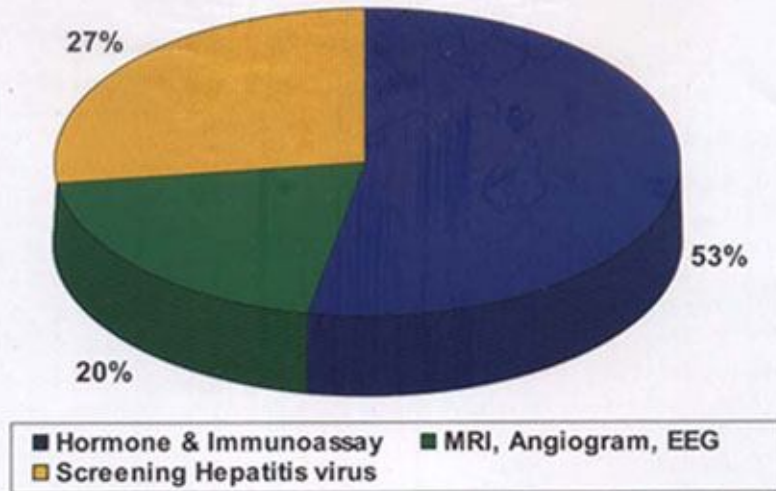
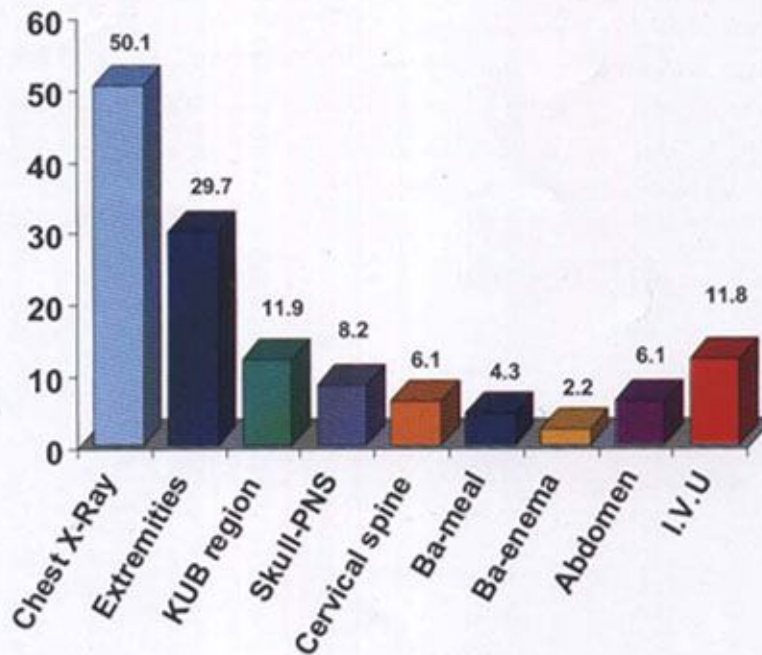


Figure-4: Distribution of different types of radiological investigation done



The figure shows that among the Radiological investigation of outdoor and indoor patient, 50.20% (n=4932) were exposed for chest X-ray, 2.29% (n=225) were exposed for plain X-ray of abdomen, 8.72% (n=857) for KUB

region, 5.08% (n=499) for skull & PNS, 4.87% (n=479) for cervical spine, 19.12% (n=1879) for extremities and others, 3.58% (n=379) for Ba-meal, 4.01% (n=394) for IVU and 1.85% (n=181) for Ba Enema.

**Discussion:**

Historically, laboratory services played a vital role in the development of modern medical practice and socially they are widely held in high regard as symbolic of the application of scientific principles in medicine. Functionally medical laboratories perform many roles beyond the simple criterion clinical necessity for treatment of patient.

The degree to which a laboratory service performs its important functions and contributes to a higher standard of health care and preventive of disease, depend on how well its service is recognized and how well it function with the other components of health service.

Laboratory services also support epidemiological surveillance and environmental control. They play a key role in early detection and identification, providing time for measures to control outbreaks of infectious disease<sup>5</sup>.

The study on the utilization of various diagnostic facilities of Holy Family Red Crescent Medical College Hospital was conducted. It has been observed that all routine and specific investigation facilities for blood, stool, urine sputum and culture & sensitivity test were available in the study Hospital. Regarding X-ray facilities, it was found that there were modern fixed and portable types X-ray machine. All plain X-rays, Ba meal, and other contrast X-ray like OCG, IVP, Ba enema, IVU, USG and ECG are performed.

During the study period a total of 49687 patients attended OPD and IPD. Among them 26151 Cases were advised for investigation, out of which 24.36% cases were Blood for routine examination, 17.72% urine for routine examination, 10.77% Blood urea, 24.46%

Blood sugar, 3.82% stool for routine examination and 18.87% were Radiological investigation of chest . In RIHD study Blood for routine examination 7.34% , 2.71% Blood sugar, (6.60%) Blood urea, 5.42% Urine of R/E, 1.58% stool for R/E and 76.34% were radiological investigation of chest and it is clearly revealed maximum patient attending in RIHD were advised or suggested for radiological investigation due to nature of illness.

Categorical distribution of investigation of OPD patient observed that highest rate was Blood sugar test (28.53%) and next highest was blood for Routine examination (21.50%), Lowest was stool for R/E 5.46%. Radiological investigations of chest were (15.56%). In BIRDEM, blood sugar examination (30.07%), Blood routine examination (9.82%), Urine R/E (1.02%), stool R/E (0.04%) in 2001-2002 were done. As HFRCMCH is a tertiary level hospital deals mainly with Medicine surgery and Gynae and Obstetrics patients, pathological investigation was more than Radiological investigation. The author Conn. R.B Conclude in similar way in his study Optimal utilization of the laboratory in making clinical decisions<sup>4</sup>.

Among 7312 patient in IPD categorical investigation done, Blood for routine examination was highest (25.38%) & stool for routine examination was lowest 3.25% which also similar in RIHD study, Blood or routine examination 11.05% and stool for R/E 1.84%. In BIRDEM indoor Blood sugar was highest 9.40% (n=108380) and Blood for routine examination was 14.18% (n=26850) the next.

In both the OPD and IPD, Some special investigation was carried out. The highest investigation was done Blood grouping



21.99%, next was S. Electrolytes 20.22% and S. Billirubin 15.17%. In BIRDEM, total Blood chemistry test 70.28% of which S. Electrolytes 9.6% was highest next was S.creatinin 4.78% S. Billirubin 0.22%, SGPT /SGOT 4.50%, In RIHD, S. Electrolytes was not done. Culture sensitivity test of blood , stool , urine and sputum were also carried out at the OPD and IPD. The percentage of Blood culture 65.94% and next Sputum for C/S 17.76% and urine for C/S 11.17% .It was differ from BIRDEM Where annual turnover of sample in around 20,000, during 2000-2001. Urine culture 38.05% which was highest and next was blood culture 8.78% and sputum culture 5.19% in BIRDEM.

Among the 30 respondent doctors, 21.05% (n=4) Medical officers's are Post graduate, among the total registered Post-graduate were 10.53% (n=2) and all the responding consultants are Post-graduate 68.42% (n=13). But 93.33% respondent gave their opinion in favour of doing investigation of every out door patient and 6.67% cases could not be done due to financial constraint in out door situation which is similar to RIHD as(83.33%) respondent gave there opinion in favour of doing. In HFRCMCH, 76.67% Doctors gave their perception about the necessity of investigation for indoor patient, while 23.33% opined as not necessary which was also similar to RIHD study.

However 53.33% Doctors gave their opinion that more facilities in regard to MRI, Echocardiogram, Angiogram, Hormone and Immune assay, HBA<sub>1</sub>C, Screening of all virus for hepatitis etc. should be added to this institute. There is already expression of investigation facilities due to lack of Hormone, Immunoassay & HBA<sub>1</sub>C 53.33% , MRI (Repair & restrated), Angiogram & EEG

20%, Screening of all virus for hepatitis 26.67% which was similar to RIDH where opinion for insufficiency of investigation facilities was due to MRI 55% , S. Electrolytes 5% Histopathology 5% and portable X-ray Machine 10%.

As resources are scarce and public funds available for health care very limited, priorities must be given to the health needs of the country and the resources available. For an optimal balance of efficiency and effectiveness of health laboratories, it is very important to achieve integration between the development of epidemiological and clinical programs and the laboratory activities that are needed to support them. Laboratory development should be based on and support its activities, should not be considered as work carried out in isolation but as part of general health programs. Bacteriological skills are generally limited to microscopic examinations at the primary health care level. However, efficient and effective control of diseases in many cases will not require sophisticated technology but adequate coverage. This is the case in tuberculosis where microscopic examination of acid fast bacilli plays a key role in the detection of infections cases and source of contamination. This is also true with the control of malaria and many other parasitic diseases<sup>7</sup>.

The demand for public health laboratories arose not from the bacteriologist but from the epidemiologist. Moreover the activities of the laboratory were first directed not towards the diagnosis of infectious disease, but towards the means by which it was spread. Epidemiology provided the original stimulus for the creation of public health laboratory and it is epidemiology which in its turn is providing the laboratories with one of the

chief means by which to assess the prevalence of disease and to bring it under control<sup>8</sup>.

The study revealed that laboratory investigation facilities at Holy Family Red Crescent Medical College Hospital are almost properly utilized. Most of the doctors perceived the idea of necessity of conducting routine investigations among indoor patient. Regarding the skill of laboratory technicians it is not up to the level as stated by doctors. Greater proportion of doctors opined that existing investigation facilities is not sufficient and they suggested for hormone assay, HBA<sub>1</sub>C estimation, MRI, Angiogram, EEG & Screening of all virus for hepatitis.

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