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RESEARCH ARTICLE

THEME: EVALUATION OF THE TECHNIQUE OF PERFORMING ANGIO-SCANNING AT CHME "LUXEMBOURG"

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Abstract

Objectives : Evaluate the technique of performingangio-scanning at CHME "Luxembourg". Methodology: This is a 2-month prospective and descriptive studyfrom April 1 to May 31, 2021. Any patient presenting an examination bulletin sent to the imagingdepartment for angio-CT and havingagreed to participate in ourstudy.

Results: Duringourstudyperiod, 1025 CT scans wereperformed, amongwhichwefound 78 angio-CT scans, representing a frequency of 7.60%. Among the 78 cases of CT angioperformed, weidentified 61 angio-thoracic (78.20%), 7 lowerlimbangio (7.90%), 5 thoraco-abdominopelvicangio-CT (6.40%). , 3 cerebral CT angio-CT (3.80%); 1 CT angiogram of the upperlimbs and the aortawith a frequency of 1.30% each. The averageage of our patients was 57 yearswithextremes of 1 month (born) and 82 years. The femalegenderwas the mostrepresentedwith 53%. Dyspnea and chest pain were the mostcommonclinicalfindings. Meglumineioxitalamate (Télébrix*) was the mostusediodinatedcontrastproductwith 65.4%. The average flow rate was 3.92 ml/s in ourstudy. The average value of Dose-Length-Product (DLP) per acquisition was 353.79 mGy.cm withextreme values of 91 to 775mGy.cm. Hot flashes were the mostfrequentlyencounteredsideeffect in our patients with a frequency of 26.9%. Among the angio-TTDM performed, 80.8% of ourexaminationscorresponded to the successcriteria

Conclusion: The CT angiography technique remains the gold technique for the exploration of veins and arteries. In the majority of cases it leads to a satisfactorydiagnosis.

Introduction:-

CT angiographyis a medicalimaging test whichinvolvesexploringveins and arteries. It combines a scanner, an automaticinjector and the administration of an opaque X-ray contrastproductintravenouslywhichimproves the

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visualization of thin-section images. Use mainly to explore the aorta as well as the arteries of the limbs, brain, neck (carotids) and kidneys. [1]

CT angiographyisprescribed in cases of blood circulation disorders. It isespeciallyindicated in people sufferingfrom or likely to sufferfromthrombosis (obstruction of a vein or artery by a bloodclot), pulmonaryembolism (migration of a clottowards the pulmonaryarteries), cerebral or aorticaneurysm (formation of a pocket on the wall of an artery) stenosis (narrowing of an artery). [2]

In Mali the number of prescribedangio-CTs has increasedconsiderably in recentyears. However, the practice of thisexaminationrequiresmastery of the differentprotocols by the technicians. [1]

The latter have a considerable place in the radiologist'sdiagnosis, becausethey are responsible for the success of excellent angio-CT vascular opacification.

Especiallysince the success of the technical performance of thisexamination (angio-CT) is not up to the expectations in particular, in the medicalimagingdepartment of the Mother-Child Hospital Center "le Luxembourg" in Bamako (according to the radiologistsfrom CHME);hence the oftenfrequentfrequency of repeated acquisitions either due to poorvenousaccess or poor opacification of the vessels. It is in thiscontextthatwe set ourselves the followingobjective:Evaluate the technique of performing the angio-CT scan at CHME “Luxembourg”.

Methodology:-

This was a prospective and descriptive studycarried out in the radiologydepartment of the Mother-Child Hospital Center “Luxembourg” running from April 1 to May 31, 2021, i.e. a duration of 2 months.

It concerned all patients of all ages of both sexes, referred to the radiologydepartment of CHME “Luxembourg” for CT angiography.

Wereincluded in ourstudy, any patient referred to the CT angio service, havingcompleted the administrative formalities and agreed to participate in the study.

Wereincluded in ourstudy, any patient for CT angiographywhohad not completed the administrative formalities and angio-CT examinationscarried out outsideourstudyperiod.

This was a non-probabilitysample;namely the CT angiographyexaminationsnumbering 78 CT scans carried out duringourstudy, i.e. 78 patients.

All our patients underwent CT angiography, whichwascarried out by a HITACHI SUPRIA 16 BARRETTES multi-detector scanner equippedwith a CARESTREAM DRY VIEW 5950 brand printer.

Data collection wascarried out on individualsurveysheets, developedusing the Epi tool. Info. V7.2 and completedfromexamination reports supplemented by questioning the patient or theircompanion.

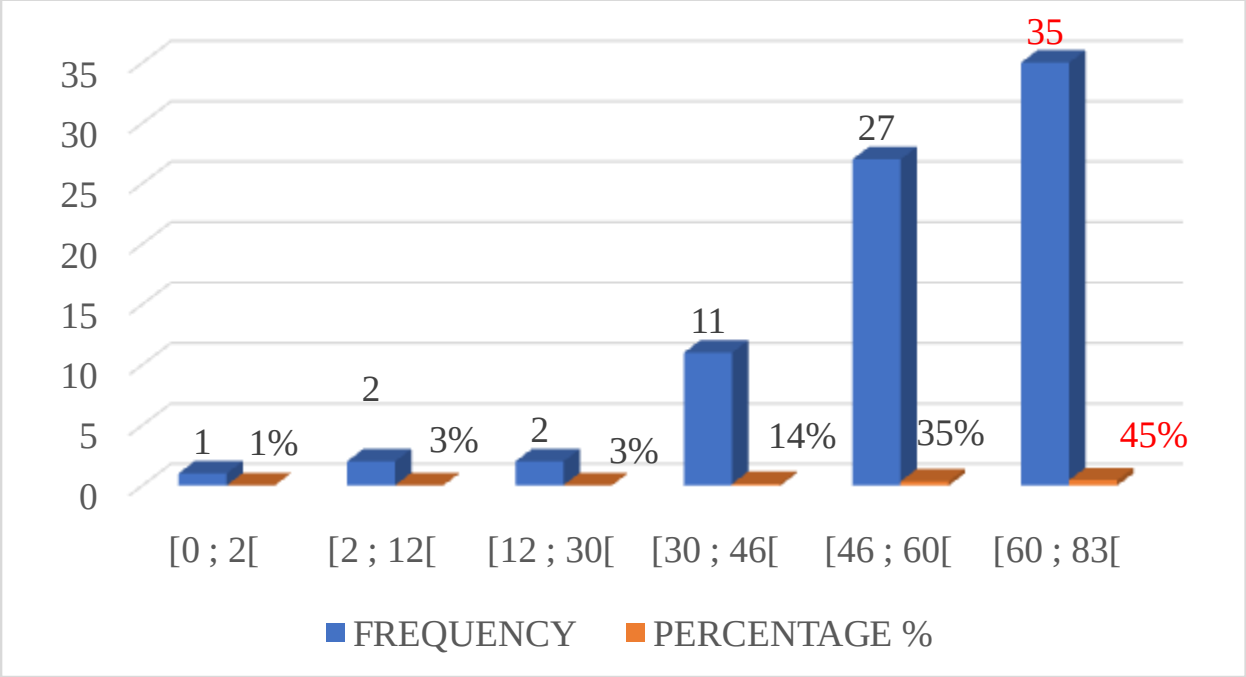
The data wereentered and analyzedusing the “SPSS version 26.0” tool;processed and presentedusing Microsoft Office 2016 software (Word, Excel and PowerPoint).

The free and informed consent of the patient or the accompanyingpersonwasacquiredbeforeeach participation in the survey, evidenced by the signing of a consent form. Respect for patient confidentialitywas essential and no judgmentwas made on the patient'sbehavioronour part.

Results:-

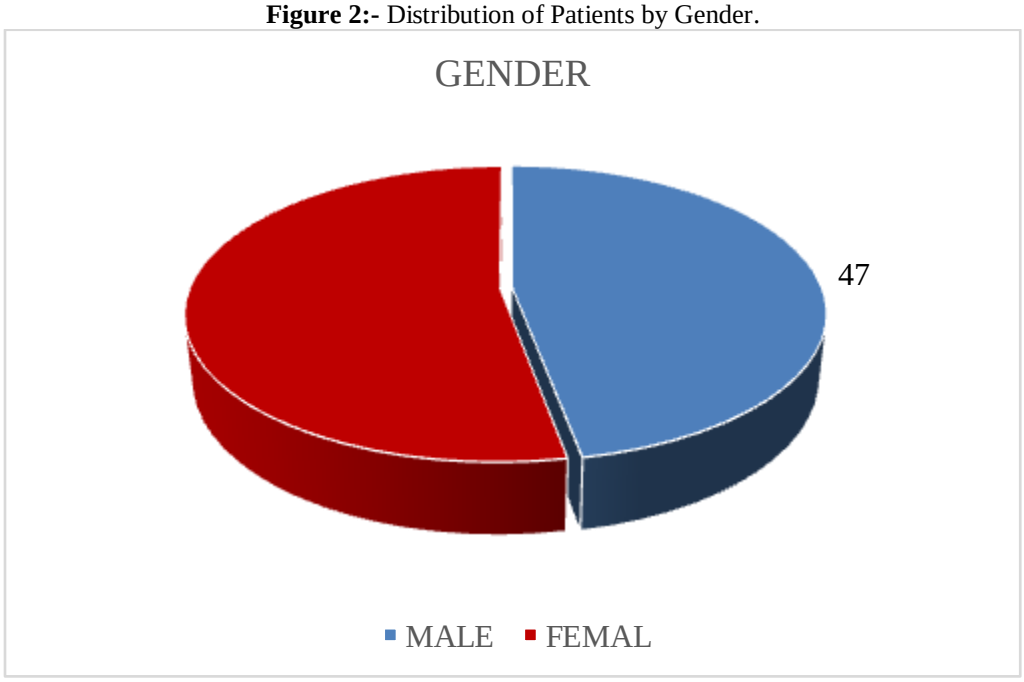
From April 1, 2021 to May 31, 2021 in the medicalimagingdepartment of the Luxembourg Mother and Child University Hospital, out of 1025 CT examinationscarried out, wecarried out 78 CT angios, i.e. 7.40%.

Figure 1:- Distribution of Patients According to Age Group.



The age group of [60-83[yearswas the mostaffectedwith 35 patients or 45% followed. The averageage of our patients was 57 yearswithextremes of 1 month (born) and 82 years.

Figure 2:- Distribution of Patients by Gender.



The femalesexis the mostaffectedwith 41 cases or 53% of the examinationscarried out.The sex ratio was 0.9.

Table I:- Distribution of Patients According to Profession.

OCCUPATION	NUMBER	PERCENTAGE (%)
RETIREES AND/OR ELDERLY PEOPLE	14	17,9
ADMINISTRATOR/SECRETARY	5	6,4
TRADER	9	11,5

MILITARY	2	2,6
FARMER	2	2,6
HOUSEHOLD	**23**	**29,5**
WORKER	4	5,1
TEACHER	4	5,1
OTHERS	15	19,2
TOTAL	**78**	**100**

Others= Accountant; driver ; Engineer ; Carpenter ; children and newborn

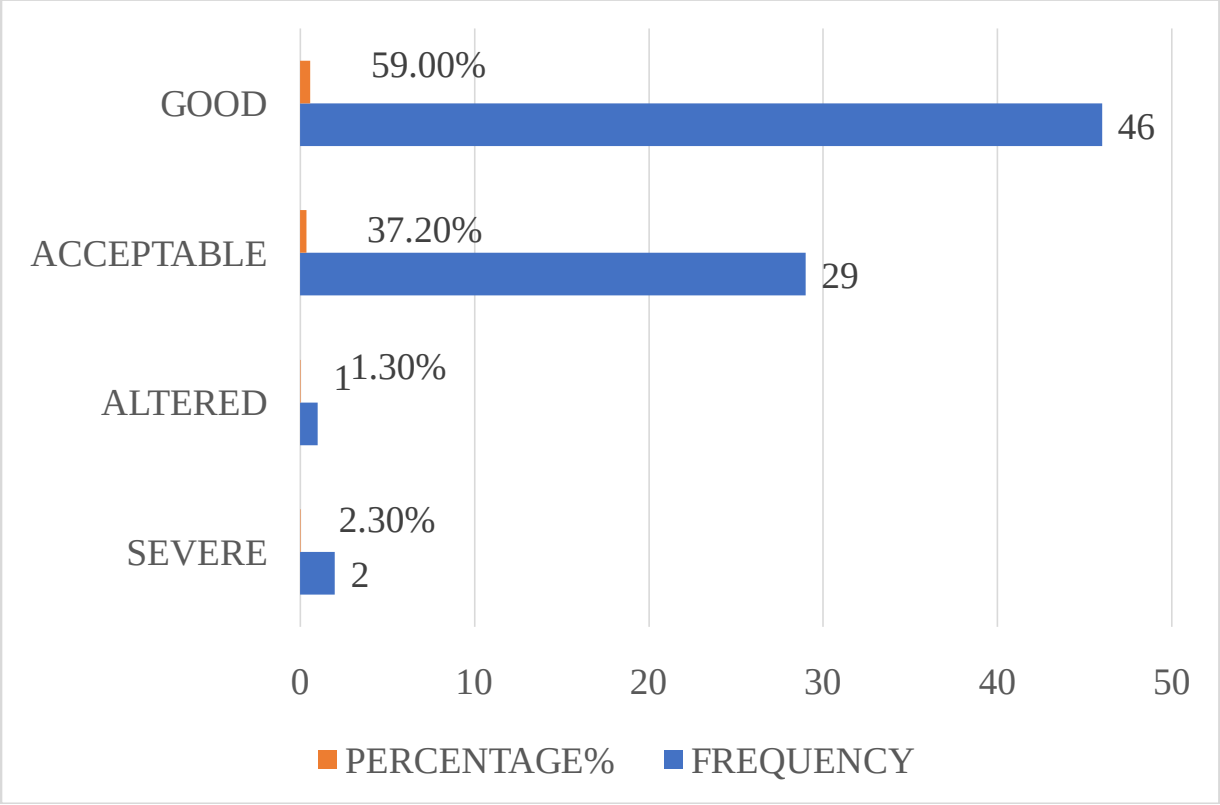
The household profession was the mostfrequentwith 23 cases or 29.5%

Table II:- Distribution of Patients According to Clinical Information.

Renseignements Cliniques	**NUMBER**	**PERCENTAGE (%)**
Confirmed or suspected Covid-19	5	6,4%
Cough+Chest pain	9	11,5%
Dyspnea and/or Chest pain	**24**	**30,8%**
Control of pulmonaryembolism	3	3,8%
Cough + chest pain and dyspnea	8	10,3%
Vascular malformation	1	1,3%
Suspected or confirmedaortic dissection	1	1,3%
Aneurysms	4	5,1%
Suspectedpulmonaryembolism	9	11,5%
Others	14	17,9%
Total	**78**	**100%**

Dyspnea and/or chest pain was the mostfrequentclinicalfindingwith 24 cases or 30.8% followed by cough + chest pain and suspicion of pulmonaryembolismwith 9 cases each or 11.5%.

Figure 3:- Distribution of Patients According to General Condition.



There were more patients with good general condition on admission with 46 cases or 59%.

Table III:- Distribution of Patients According to Psychological Preparation.

PSYCHOLOGICAL PREPARATION	**NUMBER**	**PERCENTAGE (%)**
WELL PREPARED	**59**	**75,6%**
POORLY PREPARED	19	24,4%
TOTAL	78	100%

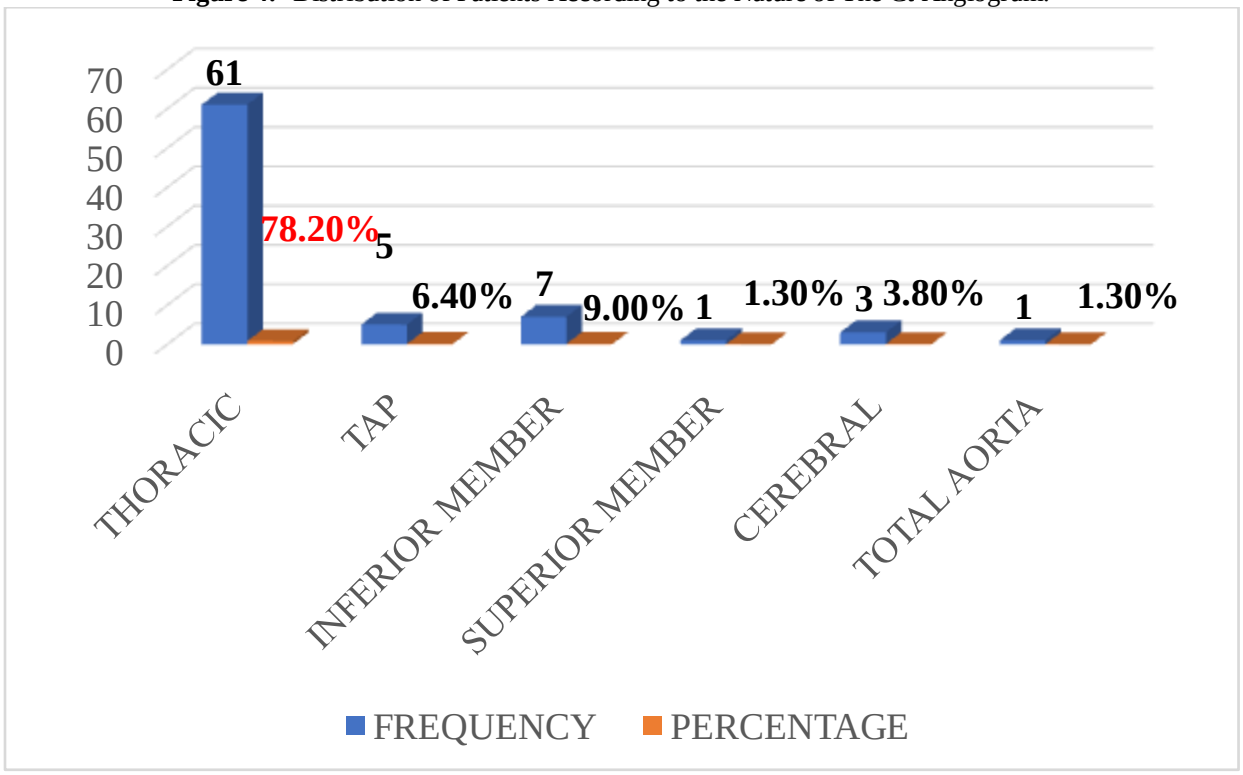
59 patients werepsychologicallywellprepared, i.e. 75.6%.

Table IV:- Distribution of Patients According to Physical Preparation.

Préparation physique	**NUMBER**	**PERCENTAGE (%)**
WELL PREPARED	**78**	**100%**
POORLY PREPARED	0	0%
GOOD VENOUS ROUTE	**78**	**100%**
BAD VENOUS LINE	0	0%
TOTAL	**78**	**100%**

The examination room waswellprepared.The existence of a possible pregnancywasruled out in all patients of childbearingage.All patients werephysicallywellprepared.

Figure 4:- Distribution of Patients According to the Nature of The Ct Angiogram.



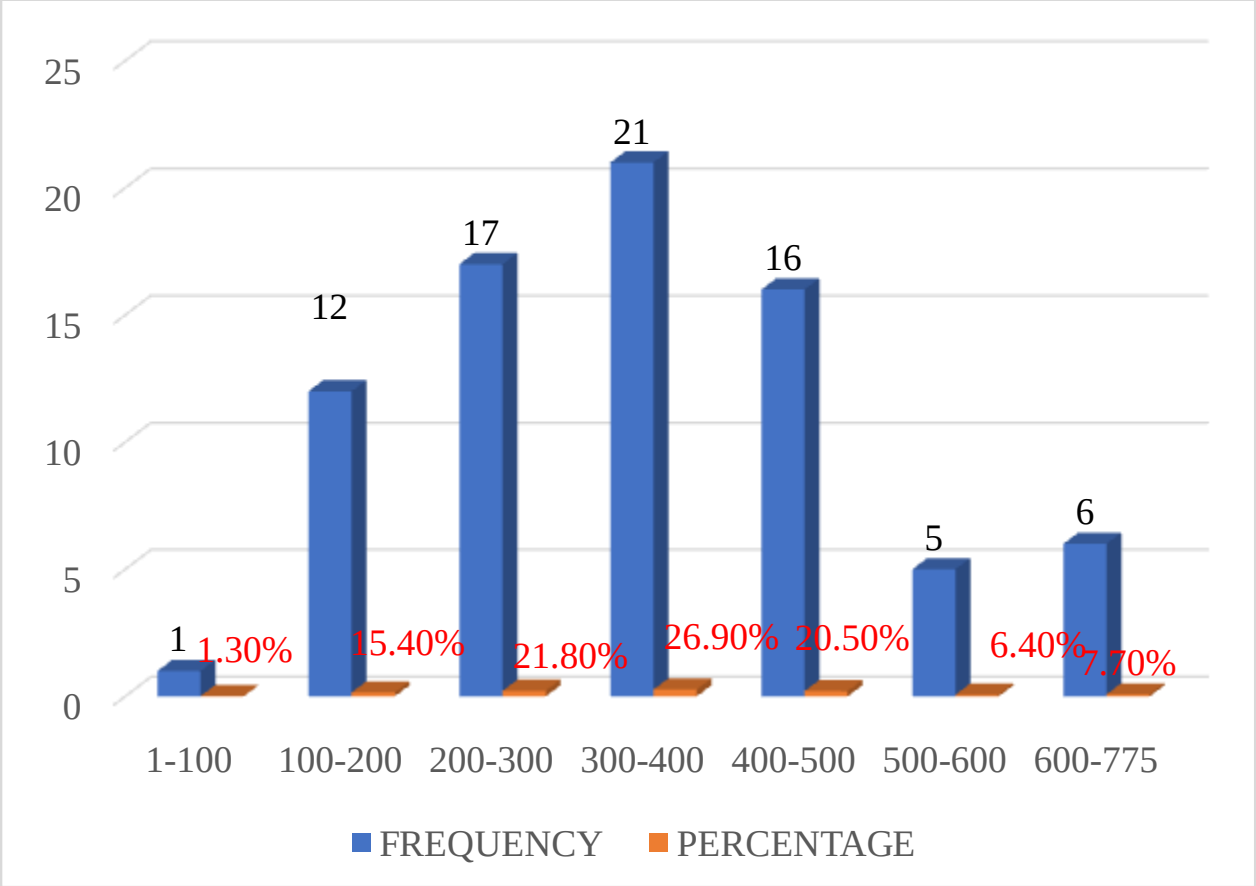
TAP : THORACO-ABDOMINAL AND PELVIC CT
Thoracic CT angiographywas the mostperformedwith 61 cases or 78.20%

Table V:- Distribution of Patients According to the Installation Position of the Ct Angiography.

INSTALLATION POSITION	**NUMBER**	**PERCENTAGE (%)**
HEAD FIRST AND ARMS ABOVE	67	85,90%
FOOT FIRST, ARMS OVERHEAD	7	8,97%
HEAD FIRST, ARMS ALONG THE BODY	4	5,13%

During the examination, the position with the head first and armsabovewas 67 cases or 85.90%. Only one (01) childwassedated, immobilized by the straps and cooperatedduringhis CT angiogram.

Figure 5:- Distribution of Patients According to Dose-Length-Product (DLP) Per Acquisition (MGY.CM).



The average DLP value was 353.79 mGy.cm withextreme values of 91 and 775 mGy.cm and standard deviation = 144.80.

The communication system wasverifiedbefore the start of acquisitions, i.e. 100%.

The ROI waswellcenteredaccording to the CT angiographyprotocol, i.e. 100%.

The PCI injection waslaunchedsimultaneouslywith the scanner acquisition button, i.e. at 100%.

Tables VI:- Distribution of Angioscanners According to the Success of the Acquisition.

SUCCESSFUL ACQUISITIONS	NUMBER	PERCENTAGE (%).
SUCCESSFUL	**63**	**80,8**
NOT PASSED	15	19,2
TOTAL	78	100%

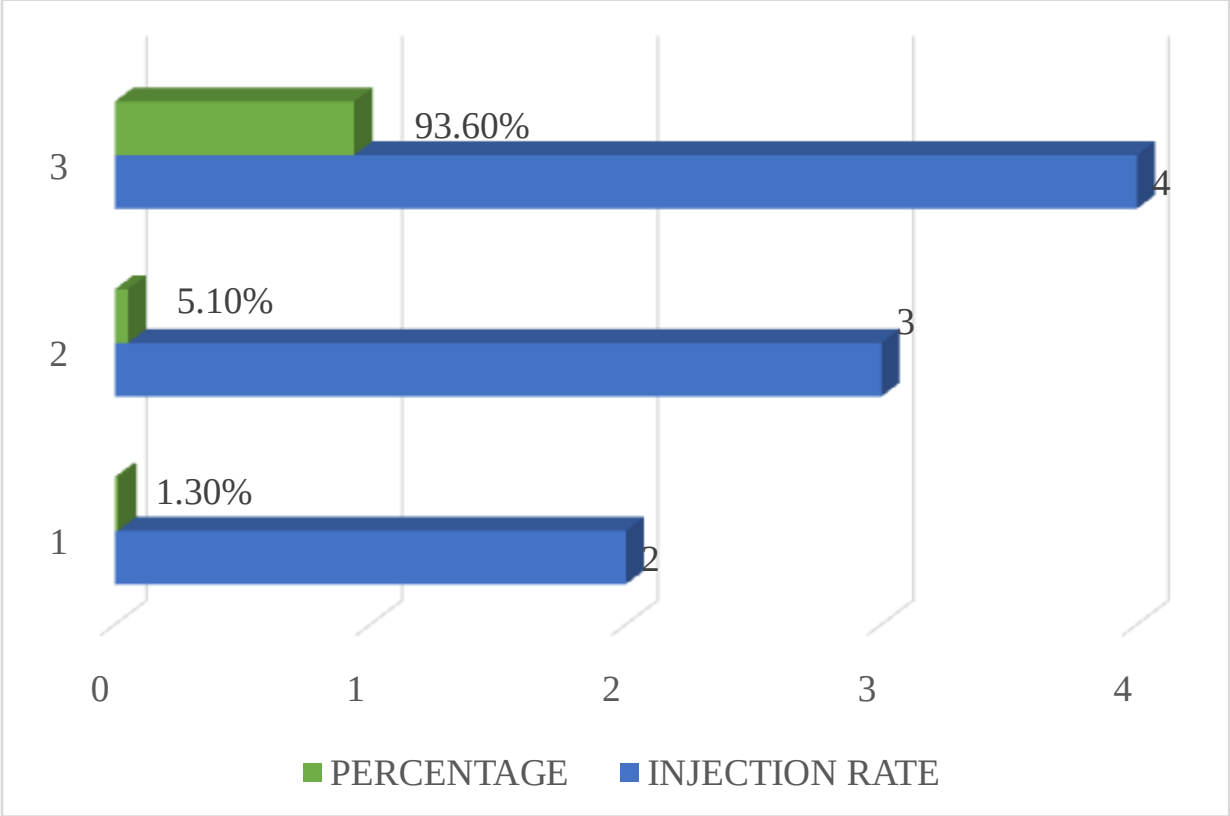
In ourstudy, 63 angioscanners weresuccessfulwithoutrepeat acquisition, i.e. 80.8% success.

Tables VIII:- Distribution of Patients According to the Type of Contrast Product Used.

NATURE OF CONTRAST PRODUCT USED	NUMBER	PERCENTAGE (%)
TELEBRIX 35	**51**	**65,4%**
OMNIPAQUE 300	27	34,6%
TOTAL	**78**	**100%**

Télébrix 35 was the mostused PCI with 65.4% compared to 34.6% for Omnipaque.

Figure 6:- Distribution of Patients According to Injection Rate of the Product



The average flow rate was 3.92 ml/s withextremes of 2 to 4ml/s and standard deviation of 0.31.

Table IX:- Distribution of Patients According to Immediate Reactions to the Product.

IMMEDIATE REACTIONS TO PRODUCTS	NUMBER	PERCENTAGE (%)
HOT FLUSH	21	26,9%
HOT FLASH+VOMITING	6	7,7%
HEADACHES	2	2,6%
NO REACTION	**49**	**62,8%**
TOTAL	78	100%

No allergicreactions for 49 patients; i.e. 62.8% followed by the occurrence of hot flashes in 26.9% of cases.

The transfer of images to the reading console was 100% automatic.

Patients or accompanyingpersonswereinformed of the appointment for the withdrawal of the report, i.e. 100%.

Discussion:-

Weconducted a prospective and descriptive study in the medicalimagingdepartment of CHME "Luxembourg" whichallowed us to evaluate the technique of performing CT angiography.

The high cost of the scanner and device breakdowns were challenges wefaced.

However, in twomonthswecollected 78 CT angiograms out of a total of 1025 CT examinationscarried out, representing a frequency of 7.60%. This resultishigherthanthat of Niakara in Burkina Faso [3] whichfound 1.7%.

The averageage of our patients was 57 yearswithextremes of 1 month (born) and 82 years. This is consistent with the literaturewhereageconstitutes a dominant risk factor in the occurrence of vascular pathologies.

The femalegenderwas the mostrepresentedwith 53%. This resultis comparable to that of Awa Gouansama Diarra [4] in Mali. This femalepredominanceisexplained by venousstasis in womenduringpregnancy, the use of oral estrogen-progestins (pills) and the sedentary lifestyle of housewives.

Dyspnea and chest pain were the mostfrequentclinicalfindings, i.e. 30.8%. This resultislowerthanthat of Diarra [4] whoobtained 91.4%.

In ourstudy, meglumineioxitalamate (Télébrix*) whichis a high osmolality tri-iodinatedionicmonomerwas the mostusediodinatedcontrastproductwith 65.4%. This resultis close to that of Sogodogo et al [5] with a frequency of 89.79% and differentfromthose of Mbozo'oMvondo et al [6] and Traore M [7] whousedexclusively Iohexol (Omnipaque *).

This choice of meglumineioxitalamateduringourstudyisexplained by the lowcost and availability of thisproduct. However, Iohexol remains the contrastproductstronglyrecommended for itselimination time and showingfewer adverse sideeffects [8].

Hot flashes were the mostfrequentlyencounteredsideeffect in our patients, with a frequency of 26.9%. This resultisdifferentfromthat of Sogodogo et al [5] whofoundnausea as the mostfrequentsideeffect.

The average flow rate was 3.92 ml/s in ourstudy. This resultwas consistent with the literaturewhere the average flow rate is 4ml/s [6] [9] [10] [7].

The average value of Dose-Length-Product (DLP) per acquisition was 353.79 mGy.cm withextreme values of 91 to 775mGy.cm

In ourstudy, 80.8% of ourexaminationscorresponded to the successcriteria of CT angiographyunlikesogodogowhichfound 100%.

Conclusion:-

Ultimately, thoracic pathologies are becoming more and more commontoday.

The appearance of signs of pain was the mostcommonreason.

However, a betterprognosisrequiresearlydiagnosis. CT angiographyremains the referenceexamination for vascular pathologies. Itssystematic introduction into the assessment of these pathologies willcontribute to improvingbetterdiagnosis.

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