Scientific Research Publishing

Open Journal of Radiology, 2018, 8, 84-90
http://www.scirp.org/journal/ojrad
ISSN Online: 2164-3032
ISSN Print: 2164-3024

Relevance of Chest CT Scan Requests in Two University Teaching Hospitals in a Developing Country

Armel Philippe Awana[1,2*], Ambroise Merci Seme Engoumou[3], Julienne Onguene Medza[4], Patrice Esame Ndive[2], Odile Fernande Zeh[2,4], Pierre Ongolo Zogo[2,5], Samuel Nko'o Amvene[2,6]

[1]Yaounde Jamot Hospital, Yaounde, Cameroon
[2]Faculty of Medicine and Biomedical Sciences, University of Yaounde I, Yaounde, Cameroon
[3]Vitro Fertilisation Yaounde Gynaecological Endoscopic Surgery and Human Reproductive Teaching Hospital, Yaounde, Cameroon
[4]Yaounde Gynaecology Obstetrics and Pediatrics Hospital, Yaounde, Cameroon
[5]Yaounde Central Hospital, Yaounde, Cameroon
[6]Yaounde University Teaching Hospital Centre, Yaounde, Cameroon
Email: *armelawana@yahoo.fr

How to cite this paper: Awana, A.P., Engoumou, A.M.S., Medza, J.O., Ndive, P.E., Zeh, O.F., Zogo, P.O. and Amvene, S.N. (2018) Relevance of Chest CT Scan Requests in Two University Teaching Hospitals in a Developing Country. *Open Journal of Radiology*, **8**, 84-90.
https://doi.org/10.4236/ojrad.2018.82010

Received: April 16, 2018
Accepted: June 22, 2018
Published: June 26, 2018

Abstract

Chest investigation is common in hospital practice. Chest X-ray is readily available and usually the first chest investigation. Thoracic CT scan constitutes an alternative and complimentary chest investigation. It is currently the most efficient investigation for the chest and its contents. **Objectives:** To evaluate the relevance of chest CT Scan requests in two university teaching hospitals in Cameroon. **Material and Methods:** We conducted a cross-sectional, retrospective and descriptive study at the Radiology and imaging units of the Yaounde Central Hospital and the Yaounde University Teaching Hospital Centre. Included in our study were files of patients who had a chest CT scan investigation during three years. **Results:** We had a study population of 323 subjects. The age interval was 23 months to 91 years old. Pulmonologist were the most prescribers with 27.2%. We had 80% conformity of indications with French Society of Radiology (FSR) standards. 50 over of 323 indications were not recommended by the FSR. **Conclusion:** There is a conformity rate of 80% between indications and the FSR recommendations.

Keywords

CT Scan, Chest, Relevance, Request, Prescribers

1. Introduction

Chest investigation is common in hospital practice. Chest X-ray is readily avail-

able and usually the first chest investigation. The method of realisation of the chest X-ray however, limits it to the diagnosis of certain pathologies [1].

Thoracic CT scan constitutes an alternative and complimentary chest investigation. It is currently the most efficient investigation for the chest and its contents [2]. In Canada, Turner concludes that Chest CT scan shows new elements in 56% for diagnosis in 2006 [3]. The benefits of this CT scan can lead to bad use of this exam.

The French National Authority for Health (F.N.A.H), the French Society of Radiology (FSR) and the French society of biophysics and Nuclear Medicine recommend good use of morphologic investigations. To this effect, a guide for good use of radiological investigations was edited with precise indications for thoracic CT scan [4]. Monkam in 1996, 8 years after the first scan in Cameroon, gave the profile of chest pathologies exams in General Hospital of Yaounde [5].

Considering the increase in the number of scanners in health facilities in Cameroon, we decided to evaluate the relevance of chest CT scan requests in two university teaching hospitals in Cameroon.

2. Methods

2.1. Type of Study

We conducted a cross-sectional, retrospective and descriptive study at the Radiology and imaging units of the Yaounde Central Hospital and the Yaounde University Teaching Hospital Centre.

Included in our study were files of patients who had a chest CT scan investigation from 2006 to 2009. We excluded all incomplete files.

2.2. Data Analysis

Parameters collected were; epidemiological profile of patients, indications for the investigation, the prescriber's speciality and the results. Our results were compared to the guide for good use of radiological investigations of the French National Authority for Health (F.N.A.H).

2.3. Statistical Method

A chi-square test was used to compare qualitatives files between the correlation of a conclusion and indication by speciality.

3. Results

3.1. Sociodemographic Characteristics

We had a study population of 323 subjects. The age interval was 23 months to 91 years old. The mean age was 46.6 years ± 20 years.

3.2. Distribution of Patients According to Sex and Age

The most represented age ranges were 31 - 40 years and 41 - 50 years. The male sex was the most represented (**Figure 1**).

3.3. Prescriber Profile

Table 1 presentes the profile of prescribers. Pneumology was the most represented speciality followed by general medicine at 27.2% and 18.6% respectively. We note that radiologist were 10.

3.4. Distribution of Indication within Pathologies Groups

Table 2 representes the distribution of indication by group. The primary indication was suspicion of tumoral lesions (44.9%), followed by lung parenchyma pathologies. There is no indication in 5.3%.

3.5. Conformity of Indications According to the French Society of Radiology Standards

Indications for Chest imaging were confronted to the French Society of Radiology recommendations. The Figure 2 represents the conformity of indication to the FSR recommendation. The conformity criteria was that the indication should be recommended by the FSR. We had 80% conformity of indications.

3.6. Inconsistent Indications

Table 3 shows the principal inconstant indications in our study. 50 of 323 indications were not recommended by the FSR. The thoracic pain was the main inconsistent indication followed by pneumonia.

3.7. Global Coherence between Indications and CT Scan Results

There was an overall accuracy of 63% between the indications and results of Chest CT scans (Figure 3). In 5% we can not evaluate the accuracy because there is no indication in request of chest scan.

3.8. Coherence of Indications and CT Scan Results According to Specialty

The correlation between the clinical exam and CT scan results varied according to different specialties. Table 4 represents the coherence of indications and results according to speciality. There was a statistically significant difference among prescribers (p = 0.001).

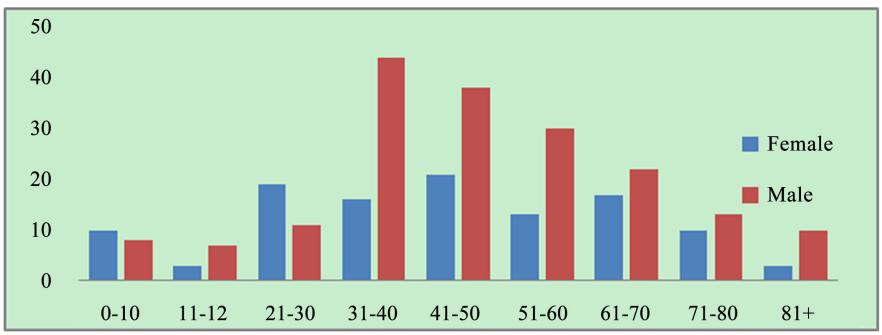

Figure 1. Distribution of patients according to sex and age.

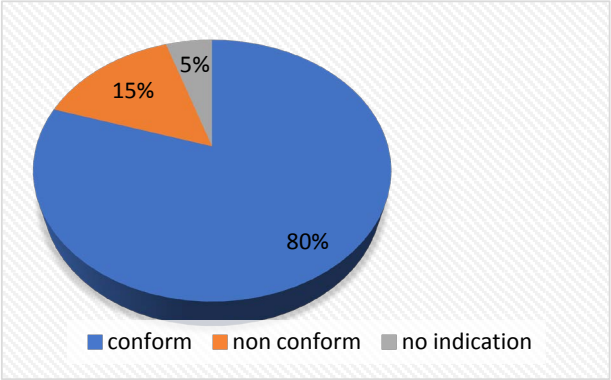

Figure 2. Conformity of indications to FSR recmmandation.

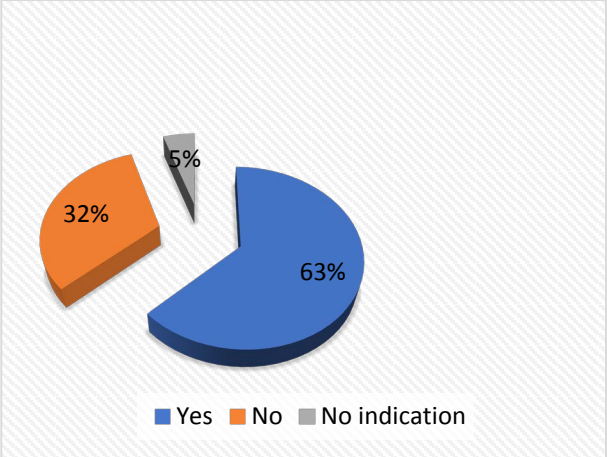

Figure 3. Percentage of overall accuracy.

Table 1. Prescriber profile.

Spéciality	*Frequency*	*Percentage %*
Pulmonologist	88	27.2
General practitioner	60	18.6
Surgeon	38	11.7
Others	37	11.4
Cardiologist	23	7.1
Anesthetist	19	5.9
Internist	15	4.6
Gastro enterologist	12	3.7
Pediatrician	11	3.4
Radiologist	10	3.1
Rheumatologist	6	1.9
Otolaryngologists	2	0.6
Oncologist	1	0.3
Hematologist	1	0.3
TOTAL	**323**	**100**

Table 2. Distribution of indications by group.

Group	Frequency	Percentage (%)
Tumoral pathology	145	44.9
Parenchymatous pathology	47	14.5
Vascular pathology	22	6.8
Traumatology	19	5.9
None indication	17	5.3
Pleural pathology	16	4.9
Others	57	17.6
TOTAL	**323**	**100**

Table 3. Inconsistent indications for chest CT scan.

Clinical indication	Frequency
Thoracic pain	17
Pneumonia	15
Tuberculosis	5
Dyspnea	5
Check up	3
Cardiac pathologies	3
Cyphoscoliosis	1
Syncopa	1
TOTAL	50

Table 4. Coherence according to speciality.

Speciality	Discordant	Concordant	Total	% concordance
Rheumatologist	0	6	6	100.0
Internist	1	13	14	92.9
Pulmonologist	22	63	85	74.1
Pediatrician	3	8	11	72.7
Surgeon	12	25	37	67.6
Cardiologist	7	14	21	66.6
General practionner	21	36	57	63.2
Others	13	19	32	59.4
Anesthetist	8	10	18	55.6
Radiologist	5	4	9	44.4
Gastro Enterologist	9	3	12	25.0

P = 0.001 CHI 2.

4. Discussion

4.1. Study Population

The mean age of our study population is comparable to those of Ngoka *et al.* at Bamako (40.5 years) and Monkam *et al.* in Yaounde (41.8 years) [5] [6]. Also, the age ranges were similar to those found in littérature [5] [6] [7].

This can be explained by the fact that, most chest diseases especially tumors, are frequent at this age [5] [6].

4.2. Profile of Chest CT Scan Prescribers

Pulmonologist were the main chest CT scan prescribers in our study. Turner *et al.* in Canada had 70% of pneumologists as prescribers in 2006 [3]. This can be explained by the fact that, most chest diseases are pneumology related. Most prescriptions of this study came from the Yaounde Jamot Hospital which is a reference centre in pneumology in Cameroon.

4.3. Indications of Chest CT Scan

There was a good knowledge by prescribers of indications coherent with FSR, as 80% of indications were coherent. This could be explained by the fact that the most represented speciality was pneumology.

4.4. Tumoral Pathologies

Our results are superior to that found by Monkam who found that tumor pathology accounted for 33.8% of applications instead of 44.9% in our study [4]. Indeed the search for tumor pathology supplanted the other clinical presomptions in this work. This confirms the importance of the thoracic CT scan in screening, localization, search for extension of tumors [1].

We found that in the tumoral pathology, the primary tumor balance was more solicited than the search for metastases. This confirmed the finding of Ngoka *et al.* who noted that in thoracic pathology, the indications were more tumor-oriented than extensional [6].

4.5. Inconsistent Indications

According to FSR, tuberculosis and pneumonia are not recommended indications for a Chest CT scan. Lone Chest pain was the main non coherent indication in our series. This cannot be an indication without a chest X ray previously done. The Chest x ray remains the first exam of investigations of chest pathologies.

Germanaud *et al.* in 2010, found out that 5.5% of indications were not coherent [8].

5% of requests did not have a clinical indication in our study. This is less than what was found by Roussel *et al.* in 2002 [9]. The execution of a particular imaging technique, especially a Chest CT scan depends on the indication.

4.6. Coherence According to Speciality

Pulmonologists have a 74% coherence despite de great number of requests. This can be explained by the fact that they are specialised in chest diseases. They also know indications and aims of exams.

5. Conclusions

At the end of this study, we can conclude that:

- Pulmonologists have the highest request rate for Chest CT scan with high coherence rate between indications and results (74%).
- There is a conformity rate of 80% between indications and the FSR recommendations.
- The main non coherent indication for chest CT scan was chest pain (17/50).

Limitation of Study

The main limitation of our study was that it was retrospective study.

Conflicts of Interest

The authors declare they have no conflict of interest.

References

[1] Haute Autorité de la Santé (2009) Principales "non-indications" de la radiographie du thorax. 1-18.

[2] Lacrosniere, L., Nores, J., Bergal, S., *et al.* (1995) Le scanner en pathologie thoracique. *La Presse Médicale*, **24**, 812-821.

[3] Turner, M., Mayo, J., Müller, N., *et al.* (2006) Computed Tomography Scans of Thorax. *Canadian Respiratory Journal*, **13**, 311-316. https://doi.org/10.1155/2006/859870

[4] Société Française de Radiologie (2005) Guide de bon usage des examens d'imagerie médicale. 46-50.

[5] Monkam, S.E. (1996) Profil de la pathologie thoracique à l'HGY. Th D Méd, Yaoundé.

[6] Ngoka, T.F. (2003) Bilan de 5 années d'activité du scanner XVID TOSHIBA à l'hôpital du Point G de 1999 à 2003. Th D Méd, Bamako.

[7] Ranaivoarison, C. and Seka, R. (1994) Bilan de l'activité scanographique au centre intégré de diagnostic et soins intensifs (C.I.D.S.I) de Treichville, Cote d'Ivoire. Abidjan.

[8] Germanaud, J., Destembert, B., Brisacier, P., Schmitt, B. and Charlon, R. (2000) Évaluation de la qualité des comptes rendus en imagerie médicale. *Revue Medicale Assurance Maladie*, **3**, 41-45.

[9] Roussel, N. and Lelièvre, P. (2002) Améliorer la qualité des prescriptions d'examens d'imagerie médicale. *Journal de Radiologie*, **83**, 621-625.