Long Term Outcome of Patients Admitted to a Chest Pain Unit in an Internal Medicine Department: Significant Reduction of Mortality and of Acute Coronary Events

Shadi Hamoud[a], Riad Mahamid[a], Sobhi Abbadi[b], Waseem Shehadeh[a], Doron Aronson[c], Tony Hayek[a], Jonathan Lessick[c]
[a]Departments of Internal medicine E, [b]Medical Imaging and [c]Cardiology, Rambam health care campus, Haifa, Israel
Corresponding Author: Shadi Hamoud

Abstract

Background Patients with chest pain still represent a great challenge for health care providers in medical institutions, mainly in internal medicine wards. Chest pain units are being incorporated in medical centers to optimize the diagnostic approach for such patients. Long term follow up of patients discharged after hospitalization with chest pain is not studied yet.

Objectives To report our two year experience with patients admitted to the chest pain unit located in our internal medicine department in a tertiary medical center, and to compare findings with those of patients who were hospitalized in the same department during the year before the chest pain unit was established.
Methods We have retrospectively collected data for patients admitted to our department during the year before the establishment of the chest pain unit, and prospectively for all the patients who were admitted to the chest pain unit for consecutive two years. Long term follow up wasperformed for all the subjects, at an average of 48.9 months following discharge. Primary end point was the composite of death, myocardial infarction, admission with unstable angina pectoris and percutaneous coronary intervention (PCI).
Results Before the establishment of the chest pain unit (CPU), 258 patients were admitted with the main complaint of chest pain, compared to 788 patients during the first two years after the establishment of the CPU. In hospitalstay was 67±45 hours during the pre CPU year compared to 27±20 hours in the CPU first two years ($p<0.001$). Multidetector computerized tomography was performed in 7% of the subjects during the pre CPU year, compared to 77.5% in the subsequent two years ($p<0.001$). Primary end points ocurred in 15.9% during the pre CPU year compared to 10.4% in the CPU first two years ($P=0.017$), mainly death, myocardial infarction and PCI.
Conclusions The application of the CPU to our internal medicine department enabled rapid investigation for patients with chest pain, shortened the in hospital stay for patients with chest pain and significantly reduced the occurence of primary end points.

Background

Chest pain is a leading cause for emergency department (ED) visits and for hospital admissions, and accounts for 5-9% of all ED visits in developed countries (1-7). The majority of patients with chest pain are usually admitted to internal medicine wards. Because of the possible life-threatening etiologies- like myocardial infarction and

acute coronary events, and of legal burden, a large proportion ofsuch patientsrequire in-hospital investigation (8-10), and constitute a great challenge for health care providers regarding the extent of the evaluation plan for each patient.

Recently, cardiologist-assisted chest pain units (CPU's) are being incorporated in the management of such patients (11-15). Most of these units are located inside or adjacent to the ED (16), and minority of them inside internal medicine departments. Beigel and co-authors (16) described their first year experience with a CPU adjacent to the ED, with 1055 consecutive patients, of whom 58 (5.5%) were admitted to hospital and 50 (4.7%) were discharged with no non-invasive tests performed. Multi-detector computed tomography (MDCT) was performed in 444 patients (42%), myocardial perfusin imaging (MPI) in 445 (42%) and stress echocardiography in 58 subjects (5.5%). Of the 1055 patients, 907 (86%) were discharged from the ED.

Medline search for long term follow up after patients discharged from CPU's revealed only few reports. Beigel et al (16) described a median follow up of 236±223 days of their 1055 CPU patients. 25 subjects (3.1%) were re-admitted with chest pain of suspected cardiac origin, and only 8 patients (0.9%) suffered a major cardio-vascular event. The authors concluded that utilization of the CPU enabled a rapid and thorough evaluation of subjects with chest pain, resulting in reduced hospitalization costs and occupancy, as well as the avoidance of misdiagnoses in the discharged patients.

In the pilot ED-located CPU study of Rubenstein et al (17), only 30 day follow up of 124 CPU patients was reported. Among these patients, there were no cardio-vascular events in any of the 40 patients who were discharged from the ED-located CPU.

We have formerly reported our one year experience with a CPU located inside our internal medicine department in a tertiary medical center, and compared the results to a year before the establishmentof the CPU (15). There were 258 subjects in the pre-CPU year compared to 417 patients in the year with the CPU. Compared to the year before the CPU, the patients during the CPU year were younger (55.2 years old compared to 57.2 years old) and a smaller proportion of them had ischemic heart disease (11% versus 33%) or hypercholesterolemia (57% versus 75%). During the CPU year, only 8% of the patients underwent exercise stress test (EST) compared to 21% in the pre-CPU year ($p<0.005$). MDCT was performed in 70% of the patients during the CPU year compared to only 7% in the pre-CPU year ($p<0.005$). Mostly significant was the difference in performing coronary artery catheterization as the first modality in patients with chest pain. The procedure was performed (as the first modality used) in as low as 1.1% in the patients during the CPU year, as compared to 14% during the year before the CPU ($p<0.001$). Furthermore, in the subjects who underwent coronary arteriography during the pre-CPU year, significant coronary artery disease (CAD) was demonstrated in only 26% of the subjects, while 34% had normal coronary vasculature, and in 40% there was non-siginificant CAD. On the other hand, during the CPU year, a total of 14.6% subjects underwent coronary arteriography, mostly as a second investigative modality. In these patients, siginificant CAD was demonstrated in as high as 85%, normal coronary arteries were demonstrated in only 5%, and 10% had non-significant CAD.

No follow up was performed in our former report.

Thom et al (18) reported their two years follow up for 898 patients who were admitted for the investigation of new onset chest pain and positive EST, and compared the results in terms of mortality, quality of life and costs, between a group of patients who underwent coronary catheterization to patients who underwent non-invasive imaging strategies, including stress cardiovascular magnetic resonance (CMR), stress SPECT or stress echocardiography. Theauthors concluded that non invasive cardiac imaging

can be used safely as the initial diagnostic test without adverse effects on patient outcomes or increased costs.
Miller et al (19) reported their experience with an observational unit (OU) for 53 patients admitted with chest pain, in which patients underwent CMR and had a 90 day follow up period, as compared to 52 subjects with chest pain in which usual care was applied. In the group of usual care, 38% had primary outcome as compared to only7% in the OU-CMR group (p=0.006): coronary artery revascularization (15% versus 2% in the OU-CMR group), hospital readmission (23% versus 8% in the OU-CMR group) and recurrent cardiac testing (17% versus 4% in the OU-CMR group). Furthermore, patients in the usual care group had longer median hospitalization stay (26 versus 21 hours, p<0.001). Post discharge acute coronary syndrome was reported in 3 patients from the usual care group, but in none in the OU-CMR group.

Objective The aim of the present study was to report long term outcome of patients with chest pain who were admitted to our CPU during consecutive two years, with comparison to similar follow up of patients who were admitted to the same department during the year before the establishment of the CPU. Primary end points were cardiovascular death, myocardial infarct, need for coronary artery revascularization and hospitalization with unstable angina pectoris. Secondary end points were defined as stroke, emergency department visit with chest pain and hospitalization with heart failure.

Patients and methods
The chest pain unit was established in our internal medicine department on 04/2010. We have already reported our experience with 417 patients during the first year of the CPU, and compared the investigation they underwent with the 258 patients who were admitted during the year before the CPU- the pre CPU year (15).
In this study, we prospectively continued to register the data regarding all the patients who were admitted to the CPU during the first two years since establishment of the CPU, and starting from 42 months after the first patient with chest pain who was admitted during the pre CPU year, weperformed a follow up for all the patients, by means of phone conversations, together with data collection using computerized medical data records.

Index admission with chest pain: Following initial independent evaluation of patients by emergency department staff, patients were admitted to the CPU if they presented to the ED with chest pain,were clinically stable, had negative troponin tests and had no new ischemic changes in electrocardiograms, andhad no obvious alternative etiology for chest pain.

Blood Tests included complete blood count, renal and liver function studies, lipid profile and two troponin tests.

Multi-Detector Computed Tomography (MDCT)A 64 slice multi-detector cardiac computerized tomography has been in use in our institute since 2007. CPU patients were evaluated by one of two 64 slice scanners: Brilliance- Philips Medical Systems, Cleveland, OH, USA, or Discovery VCT- General Electric Healthcare, Milwaukee, WI, USA. All patients with a heart rate >65 beats per minute were given a beta blocking agent (metoprolol) to reduce heart rate. A non-contrast scan was first performed for calcium score evaluation. After injection of 80 ml contrast medium, the

main scan was triggered by automatic bolus tracking at 150 HU. Tube-current modulation was performed to reduce radiation dose during systole.

Myocardial Perfusion Imaging (MPI) Studies were performed using a same-day single-isotope (Tc-99m MIBI) rest/stress protocol in all patients. For the rest study, 370 MBq (10 mCi) of Tc-MIBI were injected and imaging was started within 60 minutes after administration. Stress ECG-gated MPI was performed using 1110 MBq (30 mCi) of Tc-MIBI, injected at peak pharmacologic stress.

Invasive Coronary arteriography Procedure was performed in patients with symptoms suggestive to crescendo angina or following a positive non-invasive test result, with the option of revascularization by either percutaneous coronary intervention (PTCA) or coronary artery bypass grafting, depending on the arteriography results and the clinical condition of the patient.

Follow up The follow up visit included a questionare, in which data were collected regarding occurrence of any end points (primary and secondary) and any adverse events since the index admission with chest pain.

Statistical methods
Data analysis was performed with SPSS version 21. Descriptive statistics in terms of mean, Std, median and ranges were used for all parameters in the study. Differences between the two groups (Pre CPU vs. CPU first two years) were calculated by t-test. Categorical parameters were demonstrated by Fisher exact tests. Survival analysis was performed by Log Rank test to estimate overall survival, ACS and revascularization between to two groups. $P<0.05$ Kaplan-Meier was considered as significant.

RESULTS

During the year before the establishment of the CPU (the pre CPU year), 258 patients were admitted to the department with the main complaint of chest pain. Patient characteristics are summerized in table 1. The mean age of the patients was 56.9±12.6 years (range 26-92 years), 204 (79%) were males and 54 (21%) females. Previos CAD diagnosis was registered in 83 patients (31.7%) with 47 having previous coronary artery revascularization.

In comparison, during the CPU first two years, 788consecutive patients were admitted with the main complaint of chest pain, presumed to be of low to moderate probability of ischemic cardiac etiology. Patient characteristics are summerized in table 1. The mean age of the patients was 54.3±10.7 years (range24-84 years). CAD was known in 66 patients (8.4%) with 4.2% patients having previous coronary artery revascularization.

Table1. Characteristics of patients

	Pre CPU year (258 patients)	CPU first two years (789 patients)	P-value
Age (years)	57.2±12.6	54.3±4.9	0.001
Males	204 (79%)	550 (70%)	<0.001
History of CAD	85 (33%)	66 (8.4%)	<0.001
Prior CABG/PCI	39 (15%)	33(4.2%)	0.003
Hypertension	147 (57%)	386 (49.1%)	0.022

Diabetes Mellitus	71 (28%)	170 (21.6%)	0.041
Hyperlipidemia	193 (75%)	464 (59%)	<0.001
Current Smoking	83 (32.4%)	321 (41%)	0.009
Family history of CAD	74 (29%)	287 (36.5%)	0.024
Total risk factors number	2.22±1.1	2.07±1.2	0.077

CAD=Coronary Artery Disease. CABG=Coronary Artery Bypass Grafting. PCI=Percutaneous Coronary Intervention

Risk Factors

Risk factors of the patients are summerized in table 1. The patients in the pre CPU year were older and had significantly more ischemic heart disease, hypertension, diabetes mellitus and hyperlipidemia, but had less smoking habits and family history of IHD compared to the patients in the CPU first 2 years. Overall, there was no differnce in the total number of the risk factors between the two groups- 2.22±1.1 risk factors per patient in the pre CPU year comapred to 2.07±1.2 risk factors per patient in the CPU first two years (p=0.077).

Patient groups were comparable in the occurence of heart failure, atrial fibrillation, cerebro vascular accidents and peripheral vascular disease (data not shown).

Utilization of diagnostic tests

Exercise Stress Test (EST)

During the pre-CPU year, an EST was performed in 55 patients (21%), and was positive in 6 subjects (11%), all of which subsequentlyunderwent coronary arteriography, and significant CAD was demonstrated in only two patients, necissitating CABG in one patient and no intervention in the other. The remaining four patients had either normal coronary arteries or non significant CAD. In the 49 patients with normal EST (40 patients) or a non-conclusive test (9 patients), two patients underwent coronary arteriography for continuing chest pain, revealing normal coronary arteries in one patient and non-significant CAD in the other.

During the CPU first two years, 51 patients (6.5%) underwent EST, which was positive in 4 patients (8%), of which one patient underwent coronary arteriography revealeing non significant CAD, and three patients underwent cardiac Multi-Detector Computed Tomography (MDCT), which was normal in two patients and revealed non significant CAD in one patient. EST was normal or non conclusive in 47 patients (92%). Of 39 patients with normal EST, MDCT was performed for 4 patients, and revealed non significant CAD in 2 patients and significant CAD in 2 patients, who subsequently underwent coronary arteriography, which revealed non significant CAD in both of them. In 8 patients with non-conclusive EST results, 4 underwent MDCT which revealed non significant CAD in one patient and was normal in the other three patients, and two patients underwent coronary arteriography, which revealed normal coronary arteries in one patient and non significant CAD in the other.

Muti-Detector Computed Tomography (MDCT)

Of the most prominent differences was the proportion of the patients who underwent MDCT, which was performed for only 18 patients (7%) in the pre-CPU year, compared to as high as 617 patients (78%) in the CPU first two years (p<0.001).

During the pre CPU year, the test was normal in 10 patients (55%), showed non significant CAD in 5 patients (28%) and significant CAD in 3 patients (17%), who subsequently underwent coronary arteriography revealing significant CAD necissitating PCI in two of them.

During the CPU first two years, MDCT was performed for 617 patients (78%), and showed normal coronary arteries in 258 patients (42%), non significant CAD in 257 patients (42%) and significant CAD in 95 patients (16%). Following the MDCT findings, subsequent coronary arteriography was performed in one patient with normal MDCT and revealed non significant CAD. Of the 257 patients with non significant CAD in MDCT, 10 patients underwent coronary arteriography, which demonstrated non significant CAD in 3 patients, and significant CAD in 7 patients, of which only two patients underwent revascularization by PTCA. Of the 95 patients with significant CAD according to MDCT,77 underwent coronary arteriography, which revealed non significant CAD in 15 patients (none needed revascularizaton), and significant CAD in 62 patients, of which 53 necissitated revascularization- 45 by PTCA and 8 patients by CABG(table 2).

Table2: patients who underwent coronary arteriography following MDCT.

MDCT	Coronary Arteriography (number of patients)	Number of patients who underwent PTCA
NORMAL (N=1)	Normal (0)	0
	Non significant CAD (1)	0
	Significant CAD (0)	0
Non Significant (N=10)	Normal (0)	0
	Non significant CAD (3)	0
	Significant CAD (7)	2
Significant CAD (N=77)	Normal (0)	0
	Non significant CAD (15)	0
	Significant CAD (62)	53 (45 by PTCA and 8 by CABG)

MDCT=Multi Detector Computed Tomography; CAD=Coronary Artery Disease; PTCA=Per Cutaneous Coronary Angioplasty; CABG= Coronary Artery Bypass Grafting.

Myocardial Perfusion Imaging (MPI)

During the pre CPU year, 59 patients (23%) underwent MPI, which was normal or showed non significant ischemic findings in 51 patients (86%), two of whom underwent coronary arteriography revealing non significant CAD. The test was positive in 8 patients (14%), of whom four underwent coronary arteriography that revealed significant CAD in only one patient.

During the CPU first two years, MPI was performed in 160 patients (20%) and was normal or revealed non significant ischemic changes in 126 patients (78%), 10 of whom (8%) underwent coronary arteriography revealing significant CAD in 4 patients and normal or non significant CAD in 6 patients. MPI was positive in 34 patients (21%), of which 14 patients underwent coronary arteriography revealing significant CAD in 8 patients, necissitating angioplasty and stent insertion in four of them, non significant CAD in 4 patients and normal coronary arteries in two patients.

Coronary Arteriography

During the pre CPU year, coronary arteriography was performed in 56 patients (22%), mostly as the first investigational modality used (in 35 patients- 63%). In the 35 patients with coronary arteriography performed as the first modality used, the test revealed normal coronary arteries in 10 patients (28%), non significant CAD in 16

patients (46%) and significant CAD in only 9 patients (26%), 7 of which required PCI.

Of the 21 patients who underwent coronary arteriography following a non-invasive test, 9 (43%)had normal coronary arteries, 6 (28.5%) had non significant CAD and only 6 (28.5%) had significant CAD, of which 4 required coronary revascularization (3 patients underwent PCI and one underwent CABG). Overall, during the pre CPU year, coronary arteriography was performed in 56 patients, and revealed normal coronary arteries in 19 patients (34%), non significant CAD in 22 (39%) and significant CAD in only 15 patients (27%).

During the CPU first two years, coronary arteriography was performed in 120 patients (15.2%), mostly as a second modality utilized following a non invasive test used- in 104 patients (87%), compared to 16 patients (13%) in which the procedure was the first modality used.

Overall, the test revealed normal coronary arteries in only 3 patients (2.5%), non significant CAD in 31(25.5%) and significant CAD in 86 patients (72%).Subsequent revascularization was necissitated in 72 patients (60% of the patients who underwent coronary arteriography), of which 63 underwent PCI and 9 underwent CABG. (Table 3).

Table3: Diagnostic procedures utilizeded.

Test	Pre CPU year	CPU first 2 yearsN (%)	p-value
EST	55 (21%)	51 (6.5%)	<0.001
MDCT	18 (7%)	617 (78%)	<0.001
MPI	59 (23%)	162 (20%)	0.38
Coronary arteriography	56 (22%)	120(15.2%)	<0.001
Coronary arteriography as first modality utilized (% from the patients who underwent coronary arteriography)	35 (63%)	16 (13%)	<0.001

In-hospital stay and final diagnosis

The mean in hospital stay was67.3±45.3hours (range: 1.73-283) in the pre CPU year, compared to 27.1±20.4 hours (range: 0.78-112.8) in the CPU first two years (p<0.0001).

During the CPU first two years, final diagnoses included myocardial infarction in 13 patients (1.6%), definite or possible angina pectoris in 103 patients (13.4%) and non-cardiac chest pain in 668 patients (85%).

Alternative diagnoses were recorded in only 10 patients (6 %) in the pre CPU year, compared to 51 patients (7.5%) in the CPU first two years (p<0.001). These diagnoses included peptic or biliary diseases in 8 patients (3.1%) and pericardial disease in 2 patients (0.8%).

During the CPU first two years, final diagnoses included acute myocardial infarction in 13 patients (1.6%), angina pectoris in 103 patients (13.1%) and non cardiac chest pain in 673patients (85.3%). Alternative diagnoses included peptic or biliary diseases in 36 patients(5.5%), lung diseases (mainly pneumonia and lung infiltrates) in 11 patients (1.4%), intra thoracic tumors in 8 patients (1%), pericardial diseases (mainly pericarditis) in 5 patients (0.6%) and pulmonary embolism in 2 patients (0.25%),(Table4).

Table4: Alternative diagnoses for chest pain.

Diagnosis	Patients in pre CPU year (N=172)	Patients in CPU first 2 years (N=657)	p-value
Peptic/biliary	8 (4.8%)	36 (5.5%)	0.84
Intra thoracic tumors	0	8 (1%)	0.21
Pulmonary embolism	0	2 (0.25%)	1.00
Pericardial disease	2 (1.2%)	5 (0.71%)	0.63
Non specified/ musculoskeletal pain	162 (94%)	594 (90%)	0.13

Follow Up

With ethics committee approval (Helsinky RMB0386-11), and starting on 04/2014, phone visits were performed for subjects who were included in the study. Additional data were collected using computerized medical data systems. Visits were completed for all the subjects, at a moderate follow up duration of 46±2.6 months (range: 41.5-50.9) in the pre CPU year and 49.9±6.8 months (range: 36.9-60.9) in the CPU first two years,p<0.001.

During the visit, data were collected for all the patients, with focusing on the occurence of primary and secondary end points.

Data regarding primary outcome events in the pre CPU yearwere available for 251 patients (97.3%). The composite of primary end point (myocardial infarction, UAP, death and PCI) occured in 41 patients (16%) in the pre-CPU year and in 82 patients (10.4%) in the CPU first two years, P=0.017 (a reduction of 35.6% in the occurance of the composite end point).

During the CPU year, primary outcome events occured in 41 patients (16%) and included death in 13 patients (5.2%), myocardial infarction in 11 patients (4.4%) and hospitalization for unstable angina pectoris in 12 patients (4.8%),9patients (3.5%) underwent PCI. In comparison, during the CPU first two years, 82primary outcome events occurred in74 patients (9.4%), and included death in 17 patients (2.2%), myocardial infarction in 17 patients (2.2%) and hospitalization for unstable angina pectoris in 44 patients (5.6%)%),8 patients (1%) underwent PCI,p=0.017(table 4).

The composite of secondary end point (stroke, exacerbation of heart failure and ED visit with chest pain) occured in 69 patients (26.7%) in the pre-CPU year and in 204 patients (25.9%) in the CPU first two years, P=0.80.

During the CPU first two years, secondary outcome events occurred in 212 patients (27%). 11 patients (1.4%) had stroke, 8 patients (1%) had underwent PCI, 9 patients (1.1%) had hospitalization for exacerbation of heart failure and 184 patients (23.3%) had ED visit for chest pain.

Table4. Occurence of end points in the patient groups:

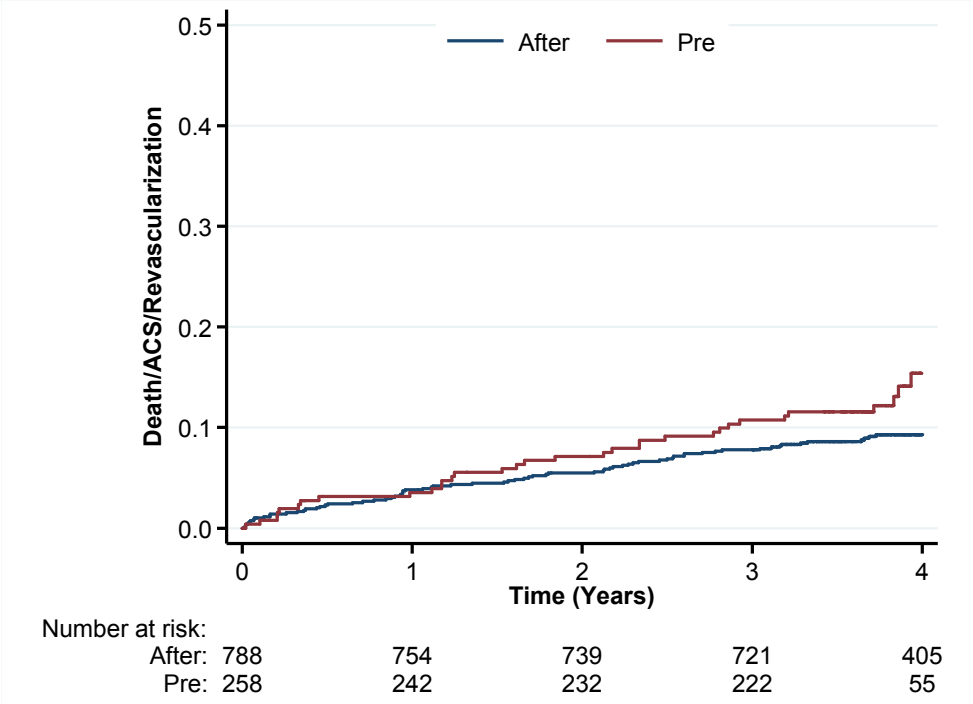
Event		Patients in pre CPU year	Patients in CPU first 2 years	p-value
Primary	Death	13 (5.2%)	17 (2.2%)	<0.0001
	MI	11 (4.4%)	17 (2.2%)	0.042
	Admission with	12 (4.8%)	44 (5.6%)	0.64

	UAP			
	Revascularization	9 (3.5%)	8 (1%)	0.01
Secondary	CVA	4 (1.6%)	11 (1.4%)	0.77
	CHF decompensation	5 (1.9%)	9 (1.1%)	0.35
	ER visit with CP	60 (23.3%)	184 (23.4%)	1.00

MI=Myocardial Infarction, UAP= Unstable Angina Pectoris, ED= Emergency Department, CP=Chest Pain. CVA=Cerebro Vascular Accident

The survival graph shows the difference in the occurrence of primary end points between the two patient groups.

Survival graph:



Discussion

Application of the CPU in our internal medicine department had multiple favorable impacts on the management of patients with chest pain:

1. Shortening of in hospital stay. The mean duration of hospitalization was shortened by 59.7% (27.1±20.4 hours in the CPU first two years compared to 67.3±45.3 hours in the pre CPU year, $p<0.0001$). This finding is consistent with our former survey describing our first year experience with CPU (15) and with other studies in the literature (16, 19). In our heavily occupied health care system, it is crucial to have such achievement, enabling health care providers to treat more subjects with so common diagnosis, to have shorter time for diagnosis and treatment and to decrease missing of working days for the subjects.
2. Utilization of non invasive procedures. Patients in the CPU first two years had 1.2±1 tests per patient performed, compared to 0.64±1.2 in the pre CPU patients ($p<0.01$). In fact, all the patients in the CPU first two years had

undegone at least one diagnostic procedure, compared to 50% in the pre CPU year, enabling the exclusion of significant CAD as an etiology for the chest pain, and the safe discharge of patients. This approach decreases the possibilty of missing diagnoses and highly excludes CAD as the etiology for chest pain.

3. Invasive procedures. Significantly fewer proportion of patients in the CPU first two years had either normal coronary arteries or non significant coronary atherosclerosis in coronary arteriography compared to the subjects in the pre CPU year, mainly when arteriography was the first modality used (13% of the procedures in the CPU first two years compared to 74% in the pre CPU year, $p<0.01$).Decreasing the need of invasive coronary procedures protects patients from exposure to possibly harmful contrast media and possible complications of the invasive procedures, and contributes to the shorter in hospital stay in the patients during the CPU first two years compared to the pre CPU year.
   Furthermore, during the CPU first two years, 15.2% of the patients underwent coronary arteriographies, compared to 22% of the patients in the pre-CPU year, a reduction of 31% in the need of performing the invasive procedure, saving the need for 54 procedures in the CPU first two years.
4. Decreased disability/interference with daily activity which could be related with the invasive procedures, mainly in patients who require a femoral approach.
5. Alternative diagnoses. Alternative diagnoses were recorded in only 10 patients (4%) in the pre CPU year, compared to 72 patients (9.2%) in the CPU first two years ($p<0.001$), and included paptic or biliary diseases, lung diseases, intra-thoracic tumors and pericardial diseases. This finding was attributed mainly to the significantly larger use of MDCT.

Study limitations

1. Our study is composed of two groups, the first one (the pre CPU year) was performed retrospectively.
2. Baseline characteristics are different, but it was worthwile to note that there was no difference in the number of risk factors per patient in the two groups- 2.22±1.1 risk factors per patient in the pre-CPU year compared to 2.07±1.2 in the CPU first two years, $p=0.77$. During the pre CPU year we retrospectively included all the subjects who were admitted with the main complaint of chest pain, whereas during the CPU first two years we aimed to exclude patients with known history of CAD. Nevertheless, even when we excluded the subjects with known CAD, no significant differences in the occurrence of primary and secondary end points was observed. This finding could be attributed to the similar risk factors number per patient between the two groups.

CONCLUSIONS

The application of the CPU in our internal medicine department enabled a rapid and efficient management of patients admitted with chest pain, prevention of unnecessary invasive procedures, significant shortening of hospitalization duration and the safe discharge of patients. The use of MDCT enabled the diagnosis of other cardiac or extra-cardiac etiologies for chest pain. Notably, patients in the CPU two years had significantly decreased mortality and recurrent myocardial infarctions compared to the patients in the pre CPU era.

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