microimmunofluorescence test (MIFT) for IgG and IgM antibodies detection. This study was undertaken to determine the seroprevalence of Chlamydia pneumoniae causing CAP among adults.

Eighty consecutive adults (age > 12 years) with clinical symptoms, signs and radiological evidence of acute CAP (duration < 4 weeks) presenting to our tertiary care center were enrolled. Clinical symptoms for inclusion were: (i) fever (>100°F) and cough; (ii) any one of the following symptoms - chest pain, breathlessness, sputum expectoration, hemoptysis, or wheeze; and (iii) radiological evidence of infiltrates, segmental or subsegmental consolidation, or parapneumonic effusion. Patients with chronic pneumonia (duration > 4 weeks), suppurative lung conditions, active pulmonary tuberculosis, aspiration or hospital acquired pneumonias, were excluded. Sera were stored at -20°C until further testing.

C. pneumoniae specific IgG and IgM antibodies were tested using the MIFT. This is an indirect fluorescent test where serially diluted patients serum was tested against a mixture of several different antigens of Chlamydia pneumoniae fixed on glass slide. The antibody specific class was assessed by commercially available conjugates of IgM or IgG, labeled with fluorescent isothiocyanate. The highest serum dilution exhibiting definite fluorescence and even distribution of elementary bodies (green) was taken as the titer. The definitive diagnostic criteria of acute infection by MIFT included any one of the following: (i) a four-fold rise in IgM antibody titer or, (ii) IgM titer > 16 or, (iii) IgG titer > 512. IgG titers with value between 8 through 256 were considered as pre-existing antibody.

Sera of 49 patients (61.2%) were positive, 8 to 512, for C. pneumoniae IgG antibody and C. pneumoniae IgM antibodies titers up to 8 occurred among 5 (6.5%) of adults presenting with acute CAP. Our study has limitation in that for the majority of our patients convalescent sera could not be obtained and higher dilutions (>1:8) of IgM positive patients could not be tested. Of the five positive patient samples, three showed a 4+ reaction. This strong fluorescence along with their clinical presentation leads us to believe that the etiology of pneumonia in these patients may be due to Chlamydia pneumoniae.

With our previous report of Mycoplasma and Legionella seroprevalence rates to be 14% together, and this study with a C. pneumoniae seroprevalence of about 6.5% show that overall these three atypical pathogens could be responsible for a-fifth of the adult acute CAP cases.

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Received : 19.4.2005; Revised : 8.9.2005; Re-Revised : 14.11.2005; Accepted : 5.12.2005

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Time to Thrombolysis in Patients with Acute Myocardial Infarction in a Tertiary Referral Centre : An Important Performance Indicator in an Emergency Department

Sir,

Acute myocardial infarction (AMI) is amongst the topmost medical emergencies presenting to the Emergency Department (ED) in which every single minute is of immense value. Early thrombolytic therapy is the cornerstone of the treatment of AMI. Prompt treatment of patients with AMI decreases death from early arrhythmias and maximizes potential benefit of thrombolytic therapy. Very early treatment with a thrombolytic agent results in a substantial (30-70%) reduction in infarct size. More than half of this effect is lost when the treatment is delayed by more than 60-75 minutes. In India, the pre-hospital emergency medical services are not developed and pre-hospital thrombolysis is not established. Hence most of the patients having AMI receive thrombolysis only after reaching the secondary or tertiary level hospitals where Intensive Coronary Care Units (ICCU) are available. Limited number of tertiary referral hospitals in India have a comprehensive ED fully equipped to administer thrombolytic therapy to patients with AMI. Since AMI is a major health problem and the outcome depends on the promptness of thrombolytic therapy, we studied the time to thrombolysis in patients with AMI as a performance indicator (PI) of the ED at a tertiary referral hospital in Mumbai city with a turnover of over 600 patients per day. Most of such studies have been conducted in the developed world where greater awareness, availability of helplines and prompt ambulance services are available. No studies on PI in the EDs are available from India, as the practice and documentation of quality parameters is not in place in most of the EDs in India.

In the present study, we analyzed the factors affecting the time to thrombolysis (onset of chest pain to thrombolysis) as well as door to thrombolysis (time gap from reaching the hospital to thrombolysis) in a tertiary referral centre from the perspective of a developing country where multiple hospital-related as well as socio-economic factors may be responsible for pre-hospital and in-hospital time-lags in thrombolysis.
The institutional ethics committee approved the study protocol and verbal consent was taken from participating subjects. Information was obtained from hospital records and through a semi-structured questionnaire. Fifty consecutive patients (36 males, 14 females) with AMI receiving thrombolysis in the ED with a mean age of 54.06 ± 13.76 years (range 30-80 years) were included in this prospective study between 1st August, 2004 through 28th September, 2004. The mean time to thrombolysis (onset of chest pain to thrombolysis) was 299.2 ± 179.57 minutes (range 10-670 minutes). The mean chest pain to hospital time was 220.9 minutes ± 174.23 (5-605 minutes) and the mean door to thrombolysis time (time from reaching the hospital to thrombolysis) was 78.3 ± 67.39 minutes (range 5-370 minutes).

Pre-hospital time lags

Of total 50 patients, 26/50 (52%) did not pay attention initially to the chest pain, 19/50 (38%) visited family physician first and were then referred to our hospital. 43/50 (86%) came to the hospital by taxis or by private vehicles and only 7/50 (14%) phoned for and came by ambulance. Of the total 50 patients, 26 (52%) took more than 1 hr to leave home to come to the hospital.

In-hospital time lags (Patient-related factors)

Out of 50 patients, 16 (32%) patients had relative contraindications for thrombolytic therapy on presentation and thrombolysis was delayed till the contraindications were resolved. In 11/50 (22%) patients, an unequivocal diagnosis of AMI could not be established on presentation and required serial electrocardiograms (ECG) and enzyme assays before a decision to thrombolysed was taken. In 3/50 (6%) patients, absence of relatives for carrying out hospital procedures, and lack of money for buying drugs (one patient) led to time lags.

In-hospital time lags (Hospital-related factors)

In 23/50 (46%) patients, there was delay in administering thrombolysis after prescription of streptokinase. This was a result of both the patients taking time to buy thrombolytic agent (which is not available in the hospital schedule) and the nursing staff being busy with other patients. In 18/50 (36%) patients, additional investigations such as CT scan, chest radiographs and biochemical profile needed to be done before the actual start of streptokinase, leading to delays. In 17/50 (34%) patients, there was delay in taking the first ECG, which resulted from queues at the ECG department. Likewise queues at the radiology department also led to delays. In 12/50 (24%), cardiologist’s opinion was required and this contributed to the time delays.

The present study highlights the complexity of issues influencing the time to thrombolysis in patients with AMI in a tertiary level hospital in a developing country. The hospital related factors responsible for delays may include rush and long queues in the hospital casualty, ECG and radiology departments; no vacancy in acute care unit of the ED; extra investigations needed to resolve the relative contraindications for thrombolysis; call to cardiologist in equivocal cases and nurses being busy. This emphasizes the need to prioritize the hospital resources towards minimizing the time lags in patients presenting with chest pain. In the west, many hospitals now have a separate chest pain unit attached to EDs.

A significant part of the pre-hospital delay in this study was due to patient’s ignorance of the seriousness of symptoms and reluctance to seek prompt medical attention. Some patients were also incorrectly treated initially by general practitioners who failed to diagnose AMI. Eleven patients (22%) who did not ignore their symptoms, reached directly to tertiary level hospital without routing through family physicians or small nursing homes, accompanied by relatives and carried enough money to buy thrombolytic agent had a door to thrombolysis time of < 60 minutes (mean 30.90 ± 23.33 minutes). This mandates the need for public education on health issues as well as refresher education programs for the medical professionals, both of which are lacking in most parts of India. Most parts of the country also do not have a pre-hospital emergency response system, committed help-lines and fully equipped ambulances to facilitate pre-hospital thrombolysis.

The time elapsed from onset of symptoms to initiation of lytic therapy is key determinant of successful coronary artery reperfusion and subsequent improved left ventricular function and survival during MI.6,7 Minimizing time to thrombolysis in AMI patients has a long way to go and a lot needs to be done towards this in India which is said to have amongst the highest prevalence of coronary artery disease and diabetes in the world.

Small sample size is a limitation of this study. However, it has highlighted various pre-hospital and in-hospital factors which can be patient-related or hospital-related and can influence the time to thrombolysis in poor patients with AMI seeking care at tertiary referral hospital in a developing country. The knowledge of these factors can guide in designing performance indicators and quality audits in EDs in developing countries.

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Received : 7.6.2005; Accepted : 30.11.2005

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