Primary Angioplasty In Acute Myocardial Infarction: Who Should Be Excluded?

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PPCI and the elderly patient

Studies have shown that age is an independent risk factor for mortality following STEMI. The elderly patients have the highest risk with STEMI, and generally comprise about more than half of all in-hospital deaths. In the 2009 Annual audit report of the British Cardiac Interventional Society (BCIS), there were 13,189 PPCI s out of a total number of 83,130 PCI s in the United Kingdom. About 11.7% cases were patients more than 80 years old. The 30 day, 6 months and one year PPCI mortality in these patients can be four times the “younger” patients.

It is always difficult to define the elderly “age group”. Various proposed limits of age include 65-70 (young elderly), 70-80 (retired elderly), 80-90 (very elderly) and more than 90 yr old (extreme elderly). Elderly STEMI patients often have significant comorbidities, absence of clear symptoms, delayed presentation, multi-vessel or calcified disease, impaired left ventricular function, and there is often a reluctance on part of the treating team to be aggressive. Above all, they have the highest risk of mortality. Despite all this, there is data to show that this population (apart from the very elderly / extremeelderly group) benefits a lot from PPCI due to reduced risk of intracranial bleeding, re-ischemia and re-infarction. The number of elderly patients (more than 74 years) ranges from 13-29% in STEMI trials and registries. It is also not surprising that only a handful of randomized STEMI trials included octogenarians or above, hence majority of the perceived benefits from PPCI treatment in these patients are based on trial results in relatively younger patients. In the PAMI Seniors trial and the French registry, there was a clear benefit for elderly people in favour of PPCI on principles mentioned above. Thrombolysis is considered too high risk for octogenarians and above, especially due to high risk of cerebral haemorrhage.

In summary, older patients have potentially much more to gain than younger patients from PPCI treatment in STEMI, and a quick risk benefit assessment must be undertaken in the catheter laboratory before proceeding to interventional treatment, which often is a complex exercise and may involve speaking to family and colleagues in arriving at a logical decision. Also, alternative options like thrombolysis can be quite risky in elderly / very elderly patients, with higher risks for bleeding, intracranial haemorrhage and higher in-hospital mortality. Above all, the benefit of any revascularisation (thrombolysis or PPCI) is many times questionable in very elderly patients.

In summary, interventional cardiologists need to rely on clinical judgment and available complex evidence to choose which elderly patients should undergo PPCI in STEMI. Following considerations will help to resolve what is often a very difficult situation: mental and emotional status of the patient, quality of life issues, physical activity and patient / family expectations, treatment compliance and full understanding of the potential benefits and risks of PPCI.

PPCI in Cardiogenic Shock

About 6.2% of UK PPCI procedures in 2008 were Cardiogenic shock patients. STEMI with cardiogenic shock has very high
mortality rates ranging from 25-50%, despite best efforts to revascularise these patients. However, these patients should not be excluded as PPCI gives them the best survival option. In general, the benefits from PPCI in these patients are achieved only if the procedure is performed as early as possible from the onset of shock. Other forms of supportive options like intra-aortic balloon pump (IABP), inotropic therapy and non-invasive / invasive ventilatory methods may be necessary. The patient needs to be stable enough to go to the cath lab, however.

**PPCI in cardiac arrest survivors/ unconscious / stroke patients**

This is a very difficult area. Registry data indicate variable survival rates in cardiac arrest survivors in STEMI. The Unconscious patient with STEMI may fall in few categories and requires individual priority and attention:
1. Out of hospital (OOH)arrest with successful resuscitation.
2. In-hospital (IH)arrest with successful resuscitation.
3. STEMI and a stroke.

It is often difficult to establish the extent of neurological damage and the prognosis for cerebral recovery in these patients, making the decision to proceed to proceed to PPCI very difficult. Consequently, in patients with clear evidence of stroke, it may be reasonable to decline PPCI as adjunctive pharmacotherapy with heparin/glycoprotein 2b3a inhibitor combined with dual antiplatelet treatment may be detrimental and can also be fatal, causing / propagating intra-cerebral or other site (gastro-intestinal) bleeding.

The prognosis is generally better in IH than OOH cardiac arrest patients. The most important factors determining their suitability to undergo PPCI include their length of downtime and the degree of successful resuscitation, electrical & haemodynamic status and neurological stability. It might seem entirely reasonable to offer PPCI to a quick & successfully resuscitated patient who is haemodynamically stable and unconscious but still within the “window period” of deliverability of PPCI, to give him the best chance, as thrombolysis is less favourable in this situation. Many of these patients will make full neurological recovery. On the contrary, it would be unreasonable to take some one to the cath lab aiming to perform angiography and PPCI who is electrically and haemodynamically unstable after a cardiac arrest and where the neurological status may be in question. Most often, the decisions have to be tailored to the specific clinical situation.

**PPCI and time delays to treatment**

This is one of the main reasons why PPCI may not be offered to a patient. Based on clinical trial evidence, PPCI is not thought to be beneficial if it can’t be performed within 90 to 120 minutes from “call for help.” However, some data suggests PPCI may still be of benefit over thrombolysis if the procedure could be performed up to 180 minutes from “call for help”. The point of reperfusion is taken when there is a balloon or stent inflated in the occluded coronary artery or passage of a thrombus aspiration catheter. Based on these facts, certain geographic areas will certainly have limited or no access to PPCI centres for timely delivery of this life saving treatment. Thrombolysis may be more quicker and effective in these cases, offering better chances of reperfusion of the infarct related vessel.

**PPCI in chest pain with left bundle branch block (LBBB)**

A lot of PPCI centres routinely exclude LBBB in the setting of new onset chest pain from PPCI treatment as it is very difficult to establish the age of the LBBB on many occasions. However, up to 10% of STEMI cases (especially elderly patients) may present with LBBB. These patients, apart from being older, also tend to have more diabetes, heart failure and co-morbid conditions. The mortality in these patients also appears to be higher than non-LBBB cases. Large PPCI centres should not exclude new onset LBBB from PPCI treatment, or should at least “assess” them for suitability on arrival via ambulance or emergency department. Quite a few of these patients will end up having a coronary angiogram but no PPCI due to absence of true occlusive luminal narrowing in the epicardial coronary vessels.

**PPCI in other difficult scenarios**

Major bleeding can complicate up to 5% of STEMI and the highest risk exists in elderly, females, femoral access. Major gastro-intestinal bleeding could occur in up to 2% patients. Often the risk of bleeding is very difficult to assess upon arrival of patient to the cath lab but if known from before, following patient groups may be better served with a conservative than invasive approach: severe anaemia, bleeding diathesis, terminal malignancy, and other significant comorbid conditions where PPCI procedure itself may pose significant risk to the patient due to increased risks of major / fatal bleeding.

Patients with established “do not resuscitate” (DNAR) orders should also not be considered for PPCI and some examples include terminal malignancy, severe cerebro-vascular disease and dementia.
SUMMARY
PPCI is the most effective treatment for STEMI if delivered in the right patient in the right time scale. However, in the real world, there are various complex scenarios affecting PPCI outcomes, leading to potential for “exclusion” of some patients from this option. As the elderly population continues to grow, we are quite likely to face many challenges in decision making, as described above. Delay to PPCI treatment is a major variable determining outcomes and other contentious issues like LBBB, comatose, unconscious patients with or without cardiac arrest, cardiogenic shock, high bleeding risk also confront the interventional cardiologist with difficult decision making of “whether to proceed or not”, with regards to this potentially life saving treatment.

REFERENCES


