Primary PCI: false positives versus false negatives

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Primary percutaneous coronary intervention (PCI) performed within 12 hours after onset of symptoms in acute ST-elevation myocardial infarction (STEMI) is the currently recommended therapy in the guidelines of the European Society of Cardiology.¹ The basis of these recommendations is an array of clinical trials comparing PCI with thrombolysis on short-term as well as long-term follow-up.² Initially and intuitively larger STEMI in younger patients were eligible for this therapy, but increasingly also smaller infarcts and older patients have proven to benefit from primary PCI.³ Typically, in centres providing the service of primary PCI in the Netherlands, about a third of the total number of PCIs is now for STEMI.

Adopting more liberal eligibility criteria for primary PCI inevitably increases not only the total number of patients but also the number of patients with alternative diagnoses referred for this service ('false positives'). The paper by Gu et al. in this issue of *Netherlands Heart Journal* emphasises alternative diagnoses encountered in such a liberal admission system of primary PCI.⁴ From a group of 820 patients referred for primary PCI they identified 19 alternative diagnoses (2.3%). If we consider only those patients actually treated by primary PCI or emergency coronary bypass surgery as true positive referrals, the number of false positives still amounts to only 5.9%. This is considerably lower than reported recently by American colleagues (14%),⁵ and can be regarded as an important indication of the quality of the triage system in our country. These better results may be due to a well-organised chain of care for primary PCI including prehospital (computer-assisted) ECG interpretation

as well as a customised communication system between ambulance services and primary PCI centre.

Even with a fine-tuned referral chain, however, there will inevitably be an inverse relationship between the proportion of false positives versus the proportion of false negatives, i.e. STEMI patients potentially eligible, but not referred for primary PCI. A system that aims to reduce the number of false negatives will thereby inevitably increase the number of false-positive referrals. Obviously adopting a more liberal system will have advantages as well as disadvantages. A benefit may be formed by, but not limited to, early availability of coronary anatomical information and early admission to tertiary centres for complex alternative disorders as shown in the paper by Gu et al.⁴ A disadvantage will be the infrastructural burden by repeated unjustified activation of the cardiac catheterisation laboratory for more false positives and potentially a longer delay in the diagnostic work-up for non-cardiovascular disorders. It is reassuring in this respect to learn from this paper that the majority of false positives (about two thirds) included cardiovascular diseases that either did not require emergency procedures or were fortunate to be referred to a tertiary centre (e.g. aortic dissection).

Even so, centres that offer a 24-hour, seven days a week primary PCI service should aim at an optimal balance between true positive vs. false positive referrals. Papers such as the one discussed here, however, cannot give us appropriate feedback in this matter. To do so it should also give sufficient insight into the number of patients that would be regarded as false negatives. Such a system that allows the evaluation of current and future primary PCI protocols could be formed by a national registry that also collects ambulance calls for patients with acute chest pain as well as final cardiovascular and non-cardiovascular diagnoses. The Netherlands Society of Cardiology (NVVC) has instituted an independent foundation: the National Cardiovascular Data Registry (NCDR). A first initiative of this registry was launched in March of this year to include electrophysiological procedures. A national registry on PCI is currently in preparation and is

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expected to be the next NCDR database that will go live. It would be most appropriate if this registry would also collect detailed data on primary coronary interventions and thereby could provide more insight into the issues raised above. In the meantime the value of the paper by Gu et al. in this issue of the Journal is that it may focus our attention more on the incidence and nature of alternative diagnoses for STEMI. ■

References

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