Open access echocardiography: from high budget to low budget referral, but what about quality of patient care and delayed referral to the cardiologist?

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Open access echocardiography (OAE) is defined as echocardiography that is requested by, reported to, and acted upon by general practitioners (GPs). Echocardiography provides information about cardiac anatomy (e.g. volumes, geometry, mass) and function (e.g. left ventricular function and wall motion, valvular function, right ventricular function, pulmonary artery pressure, pericardium).

In the population referred by the GPs, the pretest likelihood of disease is much lower than in the (prescreened) hospital population. Thus OAE is mainly used as a screening tool to exclude clinically relevant abnormalities.

The most common indications for OAE are assessment of asymptomatic murmurs, breathlessness and suspected heart failure. OAE is able to exclude significant valvular heart disease, with the exception of dynamic, exercise-related mitral regurgitation.

OAE is also valuable in a breathless patient if left ventricular (LV) dysfunction (ejection fraction <40 %) is found, leading to a management change, e.g. starting an ACE inhibitor and β -blocker. However, a normal systolic LV function in a breathless patient does not exclude a cardiac cause of breathlessness, as this may be caused by diastolic LV dysfunction, ischaemia or paroxysmal heart rhythm problems. In such cases, the echocardiographic examination needs to be interpreted in the context of clinical history and examination, ECG, exercise ECG or other tests.

Van Gurp et al. describe their experience with OAE, which was set up *independently* from the regional hospitals [1]. The aim of the study was to demonstrate that OAE reduces the number of referrals to the cardiologist and found

a decrease in intended referrals within a mean follow-up of 4 months (92 % vs. 34 %, $p < 0.001$). However, the aim of the study should have been: reducing the number of referrals, *without compromising patient care*. This means that one should also investigate subsequent patient management (change in medication), delayed referrals and hospitalisations. Ideally, this should have been investigated in a randomised controlled trial.

The indication for echocardiography (and potential referral to the cardiologist) in the present study was suspected valve disease in the majority of cases and, less often, suspected heart failure: 81 (55 %) and 55 (35 %), respectively. However, one would expect a much higher number of heart failure indications, as 54 GP practices participated. Each year approximately 7 patients are expected to develop heart failure for the first time in a Dutch average general practice of 2350 patients. Therefore, the OAE indication of suspected heart failure should have been 7 times higher, i.e. circa 375 patients instead of 55 [2]. This underutilisation of OAE in suspected heart failure is also obvious in other studies [3–5].

What are the reasons for this underutilisation of OAE for the indication of suspected heart failure?

Barriers to an accurate diagnosis include: lack of confidence in interpreting the results of technical echo reports, inertia or fear of initiating action because of anxieties about committing to an intensive course of action, such as investigations, initiation, titration and monitoring of treatment, or patients' choices, including reluctance to be investigated or treated further [6].

According to the heart failure guideline of the Dutch Association of General Practitioners, in case of suspected heart failure first an ECG and NT-proBNP should be performed. If the diagnosis of heart failure cannot be

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excluded by ECG and (NT-pro) BNP, echocardiography should always be carried out for further diagnosis or to determine the cause of heart failure. In the study by Van Gorp et al., neither an ECG nor NT-proBNP were performed before referral for OAE in 1:4 patients with suspected heart failure, in 55 % NT-proBNP was performed and in 62 % an ECG, indicating a suboptimal adherence to heart failure guidelines.

Although it is important to diagnose heart failure, which can be treated according to protocol by a GP, it is even more important to assess and address the cause of heart failure. No data are provided in the present study on the cause of heart failure and how this was addressed.

Moreover, the present study provides no information on patient treatment as a result of echocardiographic findings. However, a cross-sectional observational study, in a representative sample of 357 patients diagnosed with heart failure from 42 GP practices in the Netherlands (mean age 75 years, 77 % in NYHA class 1 or 2), found that 76.5 % of patients received diuretics. ACE inhibitors were prescribed in 40.6 % and angiotensin-II receptor blockers in 20.7 %; β -blockers were prescribed to 54.6 %, while 24.9 % received spironolactone. Only small percentages (10–25 %) of patients received drugs in the suggested daily target doses [7].

How to proceed with OAE?

Important issues for OAE are:

- 1) A local (regional or nationwide) consensus document should be created, including generally accepted indications for OAE (e.g. suspected heart failure and assessment of asymptomatic murmurs), the required pretest information, the level of training of ultrasound technicians, the way of reporting, and cardiologist advice for further treatment. In this consensus document barriers to be overcome before implementation of OAE in primary and secondary care should be identified and addressed [5]. Just as in the UK, it could turn out that not OAE, but a rapid access one-stop heart failure clinic (independent treatment centre) is the favoured model of care, offering diagnosis and initial treatment, whilst liaising with GPs and nurses for maintenance and palliative services [8]. In the present study OAE was set up *independently* from the regional hospitals, which does not seem the right way to go.
- 2) The echocardiographic examination should be performed by individuals with sufficient training and accreditation in echocardiography. In the present study it is stated that at first echocardiographic examinations were suboptimal due to lack of routine and experience of the ultrasound technicians; their accreditation level is not mentioned.
- 3) Reports of OAE should contain a minimum of information, relevant for treatment according to the guidelines. The report should be devoid of trivial abnormalities that confuse the GPs, such as mild thickening of the aortic valve in the elderly or mild MR or TR. All echo reports should be provided with a cardiologist's advice. In order to give good advice, the cardiologist needs information on relevant general and cardiovascular history, medication, physical examination, ECG and NT-proBNP. In the study by Van Gorp et al. the cardiologists received insufficient information, i.e. they only had access to the indication and patient-reported height and weight. In case of heart failure also the cause of heart failure should be searched for and mentioned.
- 4) An intensive collaboration between first-line (GPs) and second-line (cardiologists) is mandatory to prevent a decrease in the quality of patient care, both as to optimal treatment and in a search for the (potentially reversible) cause of heart failure.
- 5) Additional research is necessary, preferably a randomised controlled trial with clinical outcomes and cost-effectiveness analysis.

Currently, in the Netherlands, OAE is the result of competition in patient care and a perceived long waiting list for referral to the cardiologist. However, for society, low-threshold OAE might turn out to be more expensive due to more unnecessary echocardiographic examinations.

Apart from that, the legal consequences of an unfavourable clinical course after OAE are yet unclear.

The danger of OAE is that it leads to a 'low-budget pseudo-consult' of the cardiologist, whilst the patient thinks he is getting a state-of-the-art treatment.

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