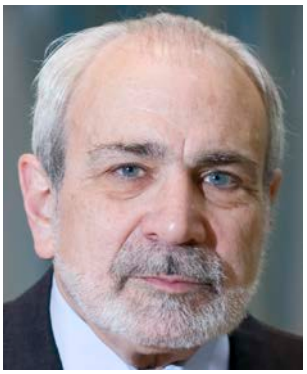
Clinical Chemistry

Are Biomarkers the Answer to the Heart Failure Readmissions Problem?



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S.M. Dunlay and A.S. Jaffe
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Guest:
Dr. Allan Jaffe is Professor of Medicine and Chair of Core Clinical Laboratory Services at the Mayo Clinic in Rochester, Minnesota.

Bob Barrett: This is the podcast from *Clinical Chemistry.* I am Bob Barrett. Readmissions after hospitalization for heart failure are an increasingly important problem, with a significant number of patients being re-hospitalized within 30 days of discharge.

The May 2013 issue of *Clinical Chemistry* published a Perspectives article asking if biomarkers are the answer to heart failure readmissions.

Dr. Allan Jaffe, an author of that paper, is a cardiologist who spent his career working in the area of cardiac biomarkers. He is Professor of Medicine and Chair of Core Clinical Laboratory Services at the Mayo Clinic in Rochester, Minnesota, and Dr. Jaffe is our guest in this podcast.

Doctor, what is the scope of the problem regarding hospital readmissions in patients with heart failure?

Dr. Allan Jaffe: Well, it's a huge problem. Roughly 25% of patients who are hospitalized with heart failure are re-hospitalized within 30 days of discharge. And this has been interpreted by some to say that the quality of care that's being provided is not as good as it ought to be, and for that reason the Centers for Medicare & Medicaid Services (CMS) began to financially penalize hospitals as of October of 2012, if they had higher than expected 30 days readmission rates, not only for heart failure, but pneumonia and acute myocardial infarction.

And this is a fairly substantial penalty, it's 1% or 2% or 3%, depending upon the criteria, not just of the DRG that is involved with the heart failure patients in this instance, but for all DRGs, so all Medicare reimbursement.

So this is a huge problem. It's being tackled in a very, very aggressive manner, and it has led to a tremendous number of approaches hopping to coordinate care, later discharge, where home-based care, variety of different initiatives in an

attempt to avoid, both the penalties, but also to help the patients.

Bob Barrett: What specific biomarkers can be used to help lower the re-hospitalization rate?

Dr. Allan Jaffe: Well, there are no 100%-proven data in this area, but biomarkers, both the ones that we have conventionally and some new ones that we will discuss subsequently, may be helpful in this regard.

So for example, with natriuretic peptides, we know that patients who have residual high values of natriuretic peptides, or who have been admitted and whose natriuretic peptides have not responded during their hospitalization, are at increased risk for re-hospitalization. So this has been used as one metric, perhaps to target patients for interventions who have this sort of pattern.

There also were initiatives utilizing standard markers like the natriuretic peptides to monitor people over time to see whether or not one can use changes in these values in the outpatient setting to anticipate when people are deteriorating and to intervene.

These are all aggressive initiatives, but they are far from proven. Nonetheless, they do provide a hint for clinicians that may provide help in this area.

Bob Barrett: What about new biomarkers that might be better than the ones in current use, could you identify those?

Dr. Allan Jaffe: Well, there are two new biomarkers that have recently been approved by the FDA for use in patients with heart failure; one called ST2 and other called galectin-3.

ST2 is what's thought to be a decoy receptor for what's known as IL-33, and IL-33 is thought to prevent the development of fibrosis and hypertrophy when it binds to ST2, which is its ligand.

If there is too much ST2 around however, particularly in the soluble form, it binds all of this IL-33 and the protection is lost.

Galectin-3 also has a central role in the development of fibrosis, and therefore patients who tend to have higher levels of galectin-3 are the ones who we think are apt to have a greater chance of developing fibrosis, and patients who develop fibrosis seem to be those that have an adverse prognosis over time.

So there is an attractive rationale for the use of either or both of these biomarkers to try and identify those patients who would be at risk for progression of their disease, and with that, readmissions.

Bob Barrett: Do clinicians know how to use these biomarkers to help reduce readmission?

Dr. Allan Jaffe: Well, not yet. The reality is that there are preliminary data for both markers that suggest that they predict which patients are going to have trouble and are going to be apt to have readmissions, but saying that doesn't mean that we know what to do about it. Because both of these markers are involved in processes related to fibrosis and in large part because there is a lot of enthusiasm now for the use of aldosterone antagonists such as Aldactone and Eplerenone, there is enthusiasm perhaps to use these biomarkers to identify individuals who ought to get those agents.

That said, it should be noted that the heart failure guidelines already suggest that in patients who are deemed to be at high risk or who are not clinically responsive, that these drugs should be used. So the question is going to be whether or not these biomarkers will have the ability to triage subsets of patients within that overall rubric, and if so help prevent readmissions.

Bob Barrett: What other issues are there that contribute to the problem of readmission?

Dr. Allan Jaffe: Well, I think that it's an interesting problem, because when we think about it, the initial response is to say, oh, all these are due to heart failure. But in point of fact, recent data, Shannon Dunlay and Veronique Roger here at Mayo Clinic have been on the forefront of these, have shown that although heart failure is the most common cause for readmission, it only accounts for about 32% of readmissions.

The vast majority of other readmissions are related to other medical problems. Since many of these patients are elderly, they can be related to trauma. They often are related to abnormal renal function. They can be related to poor control of diabetes.

So one of the critical issues here and one of the problems that biomarker approaches will face, is that the subset is about a third of the readmissions that could be identified with the biomarkers; the others are due to other problems.

Bob Barrett: Well, finally doctor, are there steps that can be taken to take care of those problems?

Dr. Allan Jaffe: Well, I think what this is, really is a call to action having to do with need to take what is often very, very sub-specialized care, and begin to coordinate it so that the experts, whether it is in the hospital or immediately outside the hospital, are able to deal with some of these additional problems, whether they are renal dysfunction, or the chance that people will fall and have trauma, or poorly controlled diabetes.

So that what needs to happen is integration, better integration of care, and this has led to the idea of case management, of outreach to patients who are recently discharged. But it's clear that although biomarkers may help with a subset that have heart failure, it's not going to be a total solution until we get better integration of the overall care of the patient.

Bob Barrett: Dr. Allan Jaffe is Professor of Medicine and Chair of Core Clinical Laboratory Services at the Mayo Clinic in Rochester, Minnesota. He has been our guest in this podcast from *Clinical Chemistry*.

I am Bob Barrett. Thanks for listening!