Impact of Medicare Shared Savings Program Accountable Care Organizations at Screening Mammography: A Retrospective Cohort Study

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Herbert Y. Kressel, MD  Hi. This is Herb Kressel and welcome to the February Radiology podcast. This month we have two stimulating conversations. First I'll be speaking with Dr. Anand Narayan formerly at Johns Hopkins University who with colleagues reported on the impact of the shared savings program for accountable care organizations under the Affordable Care Act on screening mammography rates. I think you'll find this discussion of interest particularly in view of the political dynamics underlying the Affordable Care Act these days. Next, my colleague Dr. Albert de Roos will be speaking with Dr. Auer at the University of Nottingham who with her colleagues reported on white matter changes in the brain in patients with cognitive impairment due to cerebrovascular disease. This is a very interesting and important subject and I think you'll find the discussion quite interesting. As always thank you for your interest and we look forward to any comments you have on the podcasts.

Anand K. Narayan, MD, PhD  It's a pleasure to have me, thank you so much for your time.

H.Y.K.  Dr. Narayan can you tell us about the shared savings program for accountable care organizations under the Affordable Care Act?

A.K.N.  Sure, I'd be happy to. As part of the Affordable Care Act there’s funding in place for several demonstration projects that look at different models of physician payment. Previously the model for physician payment was fee for service. Somebody will pay me a certain amount of money to do a given service and the thought is amongst various health policy circles that that incentivized people to do more. With this new thought with the accountable care organization model the idea is that you give a health care institution or organization sort of a fixed pot of money and with that fixed pot of money then it gives the providers and the institutions that are doing this incentives to be more cost conscious. Along with that the concern might be oh if you just give an organization or an institution a pot of money, they may say hey we can make more money by not doing anything at all for our patients, but the flip side of that is that the accountable care organizations also have various quality metrics built in to make sure that people are still doing a good job and still have good healthcare outcomes as well too. So the idea is by combining both of these things the sort of incentive for sort of financial incentives, but then also to quality metrics as well too and then we can foster incentives that produce lower costs of care that also produce high quality healthcare.

H.Y.K.  The idea then is if these accountable care organizations manage the money efficiently and have high quality care that they can get back some of the savings as bonus payments.

A.K.N.  Correct and the Medicare shared savings program is the largest demonstration project so far in U.S. history.

H.Y.K.  Sure what actually are accountable care organizations? How are they formed and who designates them as such?

A.K.N.  A wide variety of structures exist for accountable care organizations. Some of them may be run by hospitals. Some of them may be run by physician groups, but nevertheless it’s sort of a group of providers and within those providers they’re responsible for a certain population and the denominator for that population can vary sort of considerable depending upon the region you’re in and the population that they’re responsible for, but once you sort of form these organizations, you may say then go to CMS and say hey for whatever population that’s Medicare eligible or for whom that makes sense for Medicare, you can give us a fixed amount of money for these and we track all the outcomes associated with this, if we demonstrate that we can continue to keep high quality metrics and if we save money as well too, then we’ll participate in the savings of some of these as well too.

H.Y.K.  In essence there are provider organizations that are sharing risk for the care of a patient population?
A.K.N. Correct.

H.Y.K. Okay so now if these are supposed to share savings from cost reductions, where does screening mammography fit in and why was that included?

A.K.N. There are several metrics that are in place and as far as so one of the things that accountable care organizations have to do is show some level of quality performance as well. So they can’t just be saving money, they also have to have high quality as well and screening mammography is one of those metrics. In our world in radiology it’s one of the metrics that is tied specifically to population based health and specifically the percentage of population that are getting screening mammography and I know there are lots of debates out there about how often people should get screened and when they should start and stop and things of that sort, but many of these organizations from the accountable care organization standpoint have some built in metric there to say because most people acknowledge that to a certain a degree whether it’s every year or not every year starting at 40 or not, but that mammography saves lives and that people should ensure that their populations get a certain level of adequate mammography screening. So it’s one of the metrics that are built in there along with several others to look at quality performance.

H.Y.K. How was sort of if it’s not cost savings, so what was the metric that was used to determine you know getting a bonus based on screening mammography performance?

A.K.N. As part of a group of many other metrics in terms of preventative health care was one metric, it’s called the ACO-20 metric and it basically says it looks at the population between 40–64 and it says how often to people get mammograms. Do they get mammography within every two years? And so that’s one of the metric that’s built in with many of the others. Your performance on that metric is scored with many others as well too and it’s on a percentile basis so if you with the other metrics as well do achieve a certain percentile, then you’re eligible to get the money that you may have saved by participating in an accountable care organization.

H.Y.K. I see. Now going back to your study, what did you actually do? How did you address the question of sort of what’s been the impact on screening mammography?

A.K.N. We looked at accountable care organizations from 2012 to 2014 and what we did is we actually looked and saw, we looked at their numbers when they joined in 2012 and we looked at their numbers when they last reported in 2014 and they wanted to see what kind of changes there were in mammography screening. Compared to baseline to the most recent time period, we found small but statistically significant improvements in this specific metric, the ACO-20 metric, that looks at mammography screening overall in the accountable care organization population with some pretty large variation actually, but overall improvements in mammography screening.

H.Y.K. So the overall improvement was an aggregate of 2.6% over 300 accountable care organizations?

A.K.N. Correct yes.

H.Y.K. But I was struck I mean some have said that this is relatively modest, but as you note, 61% of the senders reported improvements. How do you reconcile these? It seems a little weird that you’d have such a large number reporting and then an aggregate have a very modest gain.

A.K.N. I think part of the thing is that within that small aggregate gain is a lot of variation and I think that’s the part that gets more exciting because we were sort of strapped at an administrative level, sort of looking at larger, looking at organizations as units essentially, but within all those units are a wide variety of strategies for improving access to screening mammography and I think that’s the interesting part where some of them showed huge improvements of 10, 20, 30 percent or so mammography screening and I think there’s a lot of information we could gain by seeing some of these organizations and saying what are they doing essentially to improve screen mammography. The incentive I think and the fact that this metric is out there is encouraging in the sense that that pushed people to improve, but I think the real information is to be gained by saying who’s doing a really good job of getting screening mammography numbers to be up and to be improved and then learning from those organizations and figuring out where we can go.

H.Y.K. Very interesting. Do you have any examples of sort of successful strategies that you found particularly compelling?

A.K.N. There’s a lot of anecdotal stuff but sort of a lot of it revolves around communication with the people in a specific accountable care organization. If you have your population of 30,000 people or something, some of the strategies I talked about revolve around how you actually connect with those populations and make sure they’re getting their screening mammography. So some strategies might say for example you know involve some level of communications and saying hey you know we have your – if you have a pretty good data system in place and say hey we’ve noticed you haven’t gotten your mammogram, it’s been about a year and a half or so, it’s about time, they may send that communication out in October just so that by the time December rolls around they would have gotten a chance to do that. A lot of the strategies talked about, and a lot of this is at the anecdotal level it’s not formally studied quite yet, but a lot of these are all sort of like really connecting with your populations and your accountable care organizations to make sure they’re getting their needed preventative services.
Lesion Topography and Microscopic White Matter Tract Damage Contribute to Cognitive Impairment in Symptomatic Carotid Artery Disease

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Albert de Roos, MD  Hello. I'm Albert de Roos, Deputy Editor for Cardiovascular Imaging and I'm joined today by Dr. Dorothee Auer from the Division of Clinical Neuroscience at the University of Nottingham. We'd like to discuss a forthcoming article in Radiology entitled “Lesion Topography and Microscopic White Matter Tract Damage Contribute to Cognitive Impairment in Symptomatic Carotid Artery Disease.” Welcome Dr. Auer.

Dorothee P. Auer, MD, PhD  Welcome and thank you for having me.

A.D.R.  So we were very much interested in the topic you have been describing in one of the next articles in Radiology and as a starter I'd like to invite you to give a flavor of the background and the motivation for this study so that the listeners and viewers can understand what the actual motivation and interest of your study is.

D.P.A.  We all know that we are living in an aging society where dementia plays a key role and a lot of focus is on Alzheimer's disease with an increase understanding that vascular dementia may play an equally important role and as a neuroradiologist I'm very interested to see what degree advanced neuroimaging techniques can help us to better understand and better diagnose patients at risk for vascular dementia.

A.D.R.  Okay so there is an Alzheimer related discussion about vascular disease which may access rates the disease process. That's an interesting position and an interesting topic to research and what was your specific purpose to solve this problem and to address this issue?

D.P.A.  That comes also a lot from my clinical practice. We are commonly asked to comment about whether detection of early signs of cognitive impairment (inaudible) or vascular disease. We were just commenting on the degree of (inaudible) changes of CT which we all know is not really good enough to predict vascular dementia. So one of my big motivations was to use the advanced brain imaging tools that we have at hand as researchers to see whether it could help to improve the diagnosis of people at risk for vascular dementia.

A.D.R.  How have you selected these patients and what were you actually studying?

D.P.A.  So the patients selected for that study were people with advanced vascular health problems, particular people who present with carotid artery disease who we followed up for the prediction of eventual stroke, so we knew we have a couple of patients with high risk of vascular, (inaudible) vascular changes. We had the opportunity with advanced imaging to look at the network changes and the structural micro-structural abnormalities in their brains and correlate that with their vascular performance. We then set out to analyze specifically the differences between cognitively impaired sub-group and the cognitively intact sub-group.

A.D.R.  So you apparently wanted to select patients with a vascular risk defined by carotid artery disease. Are you thinking that the carotid artery disease will be the driver of those changes or it's just a general marker of vascular health?

D.P.A.  I believe that it's more a marker of vascular health and that's also part informed by the findings we have. We had found the opportunity because some people presented with transient ischemic attacks or stroke that we could look directly at the acute lesion load and who's not doing well, I think there's a lot more information to be gained. But I think the preliminary evidence is positive that the accountable care organizations and the Affordable Care Act has had some positive impacts on mammography screening. So I think we have more stuff in the future to look forward to in terms of like these different experiments and learning from these as much as possible. But I think so far initial indications are positive.

H.Y.K.  Very good. Dr. Narayan it’s been a pleasure speaking with you and thank you once again for this fine article.

A.K.N.  My pleasure. Thank you so much for your time.
work out which of the two was driving the cognitive status of these people. And the finding of the paper is that actually it is more the cumulative, overall vascular abnormality in terms of the poor vascular health rather than the particular ischemia that were at the heart of the presentation. So that’s something we found in the paper that we are describing.

A.D.R. Before we get to the actual results can you still describe your MRI protocol and which features of the brain you studied with the MR protocol in these patients?

D.P.A. This is (inaudible) population so we are keen to have a short and brief brain imaging protocol that could be used in the clinic later on. So there are actually two key proponents of it. One is the classical FLAIR image to delineate the chronic lesion load. The other one is a diffusion-tensor, pre-diffusion tensor sequence which allows us to delineate the acute lesion loads, but also the microstructural abnormalities that (inaudible).

A.D.R. Okay and you used advanced techniques especially diffusion imaging, diffusion-tensor imaging, as a marker of early disease and microstructural disease. Is that correct?

D.P.A. That is correct. There’s substantial evidence that we can use the microstructural abnormality with (inaudible).

A.D.R. Okay so you speculated that vascular abnormalities will go along with early white matter changes that could be detected by diffusion-tensor imaging. And what were your actual findings because you also used a FLAIR technique to look at microscopic infarcts and white matter disease. So what were the actual findings when you compared those patients?

A.D.R. When we control for age in the cohort which is important, we’ve seen that the opposite lesion load from either acute or chronic had a very small effect on the cognitive status of the patients whereas the cumulative effect in terms of means to facility changes of white matter tracts have the strongest in fact the strongest sensation with the cognitive performance of my patient population. That was the main finding. The second important finding was again when we hypothesize that the location matters. Not only location inside the networks, but specific networks. And very interestingly a lot of the specific white matter tracts and the thalamic radiation were identified to be associated with the cognitive performance similar to (inaudible) for people looking not at patients with carotid, large artery disease, but with diseases like (inaudible) or (inaudible) disease. So it seems to be a common pattern emerging. It’s not the lesion load that is relevant but it’s the location and the severity of the tissue damage that sometimes also goes unnoticed with is the non-lesion part something that hematologists wouldn’t pick up by just eyeballing the results of the brain study, but what quantifies specifically the amount of tissue damage.

A.D.R. Okay, that’s interesting findings so not the macroscopic abnormalities are predictive but more the microscopic white matter lesions. You also have a distinction between patients with medial lobe atrophy versus a group without atrophy and you said that you classified patients as probable vascular cognitive disorder. How does this distinction work and how difficult it actually is to make this distinction?

D.P.A. This is also the motivation to do this study because it’s difficult for clinicians to be precise and sure whether this is more vascular in particular as you alluded to in the beginning, there’s this comorbidity in vascular disease and Alzheimer’s disease. For the cardiovascular disorder, it followed strictly the guidance by (inaudible) and others will have defined how the clinician currently tries to establish a diagnosis which is basically the two main (inaudible) for that definition. One is the definition that there is a criteria that there is presence of vascular event, and secondly that there is cognitive impairment, and thirdly that they can be linked in a (inaudible) context or potentially in a quantitative context. This is the clinical definition but we are aware that a lot of people can have Alzheimer’s disease. So we were aware of that limitation of the study, and to address that we looked at plausible reasonable marker of Alzheimer’s disease which is (inaudible) atrophy. We estimated that according to what (inaudible) and then found out where the main findings I’ve just referred to were (inaudible) driven by people who have both cardiovascular dementia and (inaudible) disease. What we have found is that this is not the case. Also those patients do not have (inaudible) atrophy and hence they are likely to be on the course towards Alzheimer’s disease have similar change and similar effects from their microvascular damage.

A.D.R. Very good. Some people even speculate that dementia is decreasing now-a-days because we treat all this vascular disease. So do you expect that your findings signify early disease which could potentially be treated by vascular health treatment or any other intervention? What is your speculation in this regard?

D.P.A. This is very important, in fact our patients have chosen to have not yet been demented. This is again this vascular cognitive disorder cause so they might be also (inaudible) to be impaired, so they’re exactly what is described this early group of patients in the early phases where a successful intervention would be more likely to be expected than in those who already have the dementia. We fear very much that these markers that they’re trying to develop like this skeleton MD might be extremely useful to then observe the natural course of cultural thought from an optimized health care management course by people getting more exercise or potentially be visiting (inaudible) inhibitors or any other pharmacological non-pharmacological intervention. That’s exactly what we’re hoping to do that we can have the (inaudible) to develop the biomarkers as for question markers and then see whether the treatments would be effective.
A.D.R. Okay very good. Some people may say there has been published already a lot on this topic and there are so many confounders it’s so difficult to distinguish the effect and results. What are some weaknesses of your study or maybe some issues that should be improved for future studies?

D.P.A. The obvious issue is that in order to be sure to what degree someone has Alzheimer’s pathology before clinically manifest dementia, we would need to have (inaudible) the best in vivo standard. We haven’t had that in our population. So this is a clear limitation. We think the proxy marker of (inaudible) atrophy is a reasonable proxy marker but it’s not what you would think. In terms of what this study adds of course to what’s out there already, I think it’s important exactly for the reasons we’ve been discussing, that this is a population of people with artery disease as a marker of vascular ill health who are not yet demented, and the biomarkers that we’ve been proposing out of the multitude of aspects imaging markers we could choose we propose a few select ones that can be now put to the test. The other groups, we are taking (inaudible) of course (inaudible) studies to entrusting the remaining aspects of which of these markers that have been tested for the diagnostic you have actually predicted volume. That is still to be done, but we are one step closer to doing that and we would now, and we are now, looking at also at combining that functional markers looking at resting state analysis in conjunction with structural rate.

A.D.R. So you were mentioning the word prediction and that’s still not in your article, but are you aware of any results that were predictive in this regard and that other studies have shown that or perhaps studies that are underway, can you comment on that a little bit?

D.P.A. This useful statistic the fact that it’s really only the cessation that we are describing, that gives us enough confidence to then take them forward to actually assess whether this is predicting dementia. I’m not aware that there are data in the field of brain injury studies like we’ve doing as opposed to hippocampal atrophy where there is a way to prove value to predict development of dementia and the (inaudible) pathology domain. In the vascular dementia domain this is early dates.

A.D.R. Okay so we have to look forward to future studies also by yourself and I’d like to thank you for this discussion at this point. Thank you very much.

D.P.A. Thank you very much for having me.