Contribution of Zia Uddin, PhD in the Introduction of Cardiac Markers for the Diagnosis of Acute Myocardial Infarction and Congestive Heart Failure

In **1976**, there was no provision for the quantitative laboratory testing of cardiac markers for acute myocardial infarction (AMI) in the tri-county hospitals of Southeastern Michigan.

In **1977,** I gave a lecture at the Division of Medicine, South Macomb Hospital, Warren, MI (now part of Ascension Health), and for the first time introduced the quantitative analysis of the isoenzymes of Lactic Dehydrogenase (LD) and Creatine Kinase (CK). Few cardiologists from other hospitals were also present at this lecture by me. A protocol was presented by me for the drawing of the blood of the patient. I also advised the physicians the criteria for the diagnosis of (AMI) based on the results of cardiac isoenzymes of LD and CK.

During 1977-1998, I did the interpretation (laboratory of South Macomb Hospital, Warren, MI) of the cardiac isoenzymes of LD and CK for the diagnosis of AMI. With the discovery of Troponin-I, I introduced this cardiac marker for AMI in 1999. I am the principal investigator and author of the following publications concerning efficacy of Troponin-I in the diagnosis of AMI.

> Troponin-I sensitivity and specificity for the diagnosis of acute myocardial infarction.
> J Am Osteopath Assoc 2000; 100(1): 29-32
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> Troponin-I in the diagnosis of acute myocardial infarction during pregnancy, labor, and postpartum.
> Am J Obstet Gynecol 2002; 187: 1719-20.

One of the problems for the accurate diagnosis of AMI based on the value of Troponin-I in serum, was the lack of an established reference value. I took this task and performed the Receiving Operating Curve (ROC) analysis at the laboratory of Professor Charles, Metz, Department of Radiology, University of Chicago, IL. This was the first time ROC analysis was done for the establishment of the reference value of Troponin-I.

A major problem faced by the cardiologists was the accurate diagnosis of AMI based on the combined use of three cardiac markers (Tropnin-I, isoenzymes of LD and CK). I solved this problem and was presented in the following publication.

> Common scenarios to clarify the interpretation of cardiac markers.
> J Am Osteopath Assoc 2004; 104(4): 165-76.

It will not be out of place to mention here that a similar publication appeared in the New England Journal of Medicine by a professor of cardiology, Harvard Medical School, Boston, MA.

In 2002, I was responsible for the institutionalizing of automated analyzers (manufactured by Roche Diagnostics, Switzerland) at the four hospitals (now part of Ascension, Michigan). Twenty six analytic tests were introduced at these hospitals. One of these tests was serum NT-proBNP, which measures brain natriuretic peptide to rule out congestive heart failure (CHF). I gave >25 lectures to the medical staff and the laboratory personnel, and explained to them the interpretation of the NT-pro-BNP result.

Congestive heart failure is not a solitary disease but an ensemble of several clinical aberrations leading to the disease. Roche Diagnostics proposed a reference range of 129 ng/mL. This was adopted by several reference laboratories in America. Several cardiologists were puzzled, when the result was >129 ng/mL, but the patient had no CHF. I was confronted by one cardiologist to clarify this anomaly, and my explicit answer was that it is a gross mistake by Roche Diagnostics. I did the ROC analysis and established the valid reference value at our hospitals, manifesting also the age dependent values.

Twenty six cardiologists at Ascension Michigan, wrote a letter to Anthony R. Tersigni, EdD, FACHE, CEO, St. John Hospital, Detroit, requesting to delete this test for the diagnosis of CHF. These cardiologists had doubt about the usefulness of this laboratory test.

A meeting of all the cardiologists of the four hospitals was requested and I was asked to defend the administration. **No other** medical staff of the four laboratories was invited at this meeting. I was given a short notice, and I spoke extemporaneously and defended the administration. All the cardiologists who were previously baffled accepted my interpretation of the NT-proBNP result.

I also gave a lecture on the usefulness of NT-proBNP to the joined meeting of the Divisions of Medicine, Family Medicine and Emergency, Ascension Macomb-Oakland Hospital, Warren-Madison Heights. The NT-proBNP test is used at Ascension Michigan for the last seventeen years.

During employment at the Ascension Macomb-Oakland Hospital (1981-2005), my technical expertise was solicited by the corporate legal counsel of the hospital in several malpractice litigations. The administrator of the hospital asked to me to defend the hospital involving AMI of a patient. I prepared the brief for the corporate legal counsel, and the malpractice suit was thrown out by the judge. My defense of the hospital was virtually identical to that of an amicus curie cardiologist of international repute.

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