Author’s response to reviews

Title: CHA2DS2-VASC score as a preprocedural predictors of contrast-induced nephropathy among patients with chronic total occlusion undergoing percutaneous coronary intervention: a single center experence

Authors:
Yong Wang (drwangyong2016@163.com)
Hong-wei Zhao (527732608@qq.com)
Xiao-jiao Zhang (434990871@qq.com)
bao-jun Chen (18940221007@163.com)
Guo-ning Yu (drwangyong321@163.com)
Ai-jie Hou (houaijie321@163.com)
Bo Luan (luanbo2016@163.com)

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REVIEWER COMMENTS FROM REPORT: The study needs significant improvements. The methods for estimation of predictors is unclear.

1. The objectives of the study are not driven by an biological hypothesis and appear to be data driven.
Answer: It seems that this study is driven by biological hypothesis, however, this is not true. CIN is an important complication after interventional procedures, especially in the setting of CTO lesions. The mechanism of CIN is still not fully understood today, however, accumulating evidences had suggested CIN is closely related to heart failure, hypertension, age ≥ 75 years, diabetes, and even female patients. The pathophysiology of CIN is complex and poorly understood. Multiple mechanisms act in concert to induce CIN. Intrarenal vasoconstriction, generation of reactive oxygen species, and direct tubular damage are the predominant factors that lead to CIN. In many studies, higher prevalence of CIN was observed in patients with congest heart failure, hypertension, increased age, diabetes and cardiocerebral vascular diseases. These individuals have a declined endothelial function resulting in reduced vasodilator responses as well as a reduced capacity for vascular repair with pluripotent stem cells. Additionally, Mehran risk score is a most widely used and classic model for CIN including (hypertension, IABP, congest heart failure, age ≥ 75 years, diabetes, anemia, contrast media volume, creatinine > 1.5mg/dl or eGFR < ml/min/1.73m2). However IABP, contrast media volume only
obtained after the procedure, so we can not predict the CIN before the procedure. CHA2DS2-VASC risk score included quite a lot of traditional risk factors of CIN.


2. It is not clear what the authors mean by prediction. Do they refer to independent predictor as lots of variables can predict lots of outcomes.
Answer: We refer to independent predictor as lots of variables can predict one thing (such as CIN). As CHADS2-VASc score included quite a lot of risk factors of CIN, we use it preprocedurally to predict CIN of CTO patients undergoing PCI.
To predict CIN, Pulse pressure, LDL-C, uric acid, baseline eGFR, total amount of contrast, and CHA2DS2-VASC risk score were included in the univariate analysis. Parameters with P < 0.05 were included in the multiple logistic analysis. We have consulted statistics experts. Thank you for your careful revision.

3. The selection of a consecutive rather than random sample raises problems which are not discussed.
Answer: Consecutive cases of CTO undergoing PCI were enrolled. Baseline serum creatinine was tested on admission. The serum creatinine level was monitored to 72 hours after the operation to observe the occurrence of CIN. If creatinine rise at least 0.5 mg/dl or ≥25% from baseline within 72 h following cardiac catheterization, they were CIN group, others were non-CIN group. In this study, the creatinine determined the group of the Patients. Thank you for your careful revision.

4. There is no clear description on what are the important outcomes of interest and what are the relevant gold standard. We learn about these the first time in the discussion section or figures.
Answer: The important outcome of this study was the prediction value of CHADS2-VASC for CIN. Firstly we investigated the clinical characteristics of study population according to CHA2DS2-VASC. Secondly we investigated the clinical characteristics of the patients with and without contrast-induced nephropathy (to see if there is a difference in CHA2DS2-VASC between CIN and non-CIN ). Lastly, we investigated the Independent Predictors of Pre-procedural Contrast-Induced Nephropathy in Patients with CTO and tried to investigate the predictable value of CHA2DS2-VASC score in CIN.