Fasting vs Non-Fasting Status: It's Time to End the NPO Order for Most Patients

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In a 2010 editor's page,[1] I summarized the opinions of several prominent interventionalists who expressed their interest and belief that the nil per os (NPO) order has outlived its usefulness. In our current environment, NPO does not have to be the rule before cardiac catheterization for most patients. Historically, the NPO or fasting order usually started at midnight the evening before the procedure. No water, liquids, or food except medications could be consumed until the time of the procedure. The patient remained in the fasting state often for more than 6-8 hours. Fasting was associated with dehydration, patient discomfort and dissatisfaction, and potentially exacerbating renal failure and hyperglycemia. The initial rationale for NPO came from our anesthetic colleagues who worried about intubating patients with a full stomach, and the attendant risk of aspiration and pneumonia. The NPO order also was of importance for cath lab patients at an earlier time when we used high-osmolar contrast media which was much more toxic, often causing nausea, vomiting, hypotension, arrhythmias, and heart block. Furthermore, concerns about moderate conscious sedation in advertently becoming deeper sedation (and need for intubation) also reinforced the fear of eliminating the NPO order.

The evolution of cardiac cath lab techniques, contrast media, and type of conscious sedation with dedicated nurse monitoring have made the procedure much safer, and the incidence of vomiting and need for intubation a rarity. The elimination of the NPO order would provide better patient hydration and euvolemia. Moderate or mild conscious sedation would be unaffected by NPO. Given that the risk of emergency intubation for cardiac arrest is rare (<0.1%), a blanket order for NPO does not make sense. Moving from fasting to ad lib liquids would eliminate the need to alter insulin doses, reduce volume depletion, hyperglycemia, and the number of disgruntled, hungry patients who complain about the quality of our cath lab procedures. Physician, nursing, and patient satisfaction would be higher if we eliminated the NPO order.

There have been few studies to demonstrate the value of the NPO order. Recently, Boukanter and colleagues[2] published the results of the TONIC trial, which randomized patients to a non-fasting or fasting regimen before interventional coronary procedures. Of the 700 patients who were randomized in the TONIC protocol, the non-fasting group was found to have non-inferior outcomes compared to the NPO or fasting group. There were no food-related adverse events, contrast-related kidney injuries, or other complaints. It was noteworthy that in Boukanter and colleagues' study,[2] no patient had an aspiration event. The incidence of acute kidney injury was also low and nearly the same at 2% for fasting and 4% for non-fasting (*P*=.08). The overall patient satisfaction scores and perceived pain or discomfort levels were similar in both groups. But the non-fasting patients had statistically less hunger and thirst when asked. When confronted with repeat coronary procedures, most patients (about 80%) stated that they would choose a non-fasting strategy. It should be noted that in the TONIC trial, only 21% of the enrolled patients received conscious sedation. Thus, based on this study and others,[3,4] NPO could certainly be eliminated in a large majority of patients undergoing cath.

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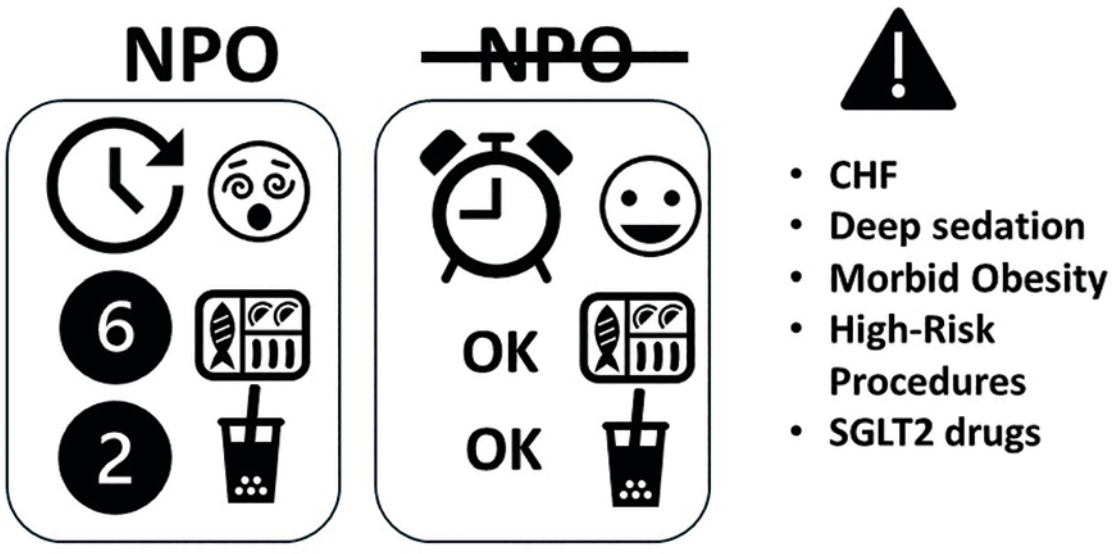

Figure. The NPO order and selective applications. (Left panel) Current recommendation for NPO is to withhold solid food 6 hours and liquids 2 hours before the procedure. (Middle panel) Patients are more satisfied when free to eat and drink before the procedure. (Right panel) Caution is indicated and NPO should be reconsidered for patients with the listed conditions.

NPO for High-Risk Patients

Support for reducing the duration of fasting can be found in the Society for Cardiovascular Angiography and Interventions (SCAI) consensus update on best practices in the cardiac cath lab by Naidu and colleagues.[5] An abbreviated fasting regimen of withholding liquids for two hours and solids for six hours before the procedure, permitting the patient to have ad libitum access to fluids and a meal before the procedure, is advocated (Figure).

However, there will be some patients, known in advance of the procedure, who may require a greater safety margin and increased level of care. In the high-risk patients such as those undergoing some structural interventions, electrophysiology procedures, or patients undergoing significant high-risk percutaneous coronary intervention such as chronic total occlusion procedures or those having a high calcium burden, or revascularization of the last remaining patent vessel coupled with a low ejection fraction, maintaining the NPO order might be prudent. Clearly patients

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who have marginal cardiac function may also be at risk for hemodynamic collapse and rescue measures including intubation. In such individuals, we should focus our attention and apply the NPO order set selectively as opposed to having all patients be NPO.

NPO and Controversial Presentations

Controversial areas and the NPO order include the approach to emergency patients, women in labor and procedures done under deep sedation, severe heart failure, hemodynamic instability, morbid obesity, significant sleep apnea, and symptomatic gastric motility disorders.[6] The TONIC trial had a few limitations that tempered our enthusiasm for an all-comer non-fasting approach. While most procedures used radial access, 8% were performed using femoral artery access. Femoral artery access hemostasis requires at least 4 hours lying flat (longer for larger bore access), a position associated with a higher risk for aspiration, transition to general anesthesia, or the development of respiratory failure. Of note, only 15% of the TONIC patients had New York Heart Association (NYHA) functional class III or IV heart failure. We may have missed events associated with heart failure patients who are at higher risk of respiratory failure or need for bi-pap positive airway pressure support or even intubation. More data would be needed to provide blanket NPO statement for these types of individuals.

NPO and SGLT-2 Inhibitors

A cautionary note should be added since some of the new SGLT-2 inhibitors may be associated with gastric retention.[7] Thus, even fasting for 6 hours may be insufficient and problematic in such patients. We recently discussed this subject in another editor's page,[8] suggesting that withholding SGLT-2 inhibitors for several days before the procedure is required. Perhaps this admonition may also go by the wayside, given the fact that the incidence of vomiting in the cath lab is so rare.

The Bottom Line

I favor selective use of the NPO order in the cath lab. Eliminating the NPO order could result in fewer procedural cancellations, more opportunities to add patients to the schedule, and an improvement in catheterization laboratory efficiency and flow. However, as noted in the TONIC trial limitations, for patients at high risk, a thorough assessment will be needed in these patients before permitting liberalized oral intake before cardiac catheterization. Like all things in the cath lab, good judgement is required and often trumps blanket regulations. ■

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