CAT – Block 3
Joshua Burkhardt

Question: What NSAID has the lowest vs highest cardiac risk profile?

Bally M, Dendukuri N, Rich B, Nadeau L, Helin-Salmivaara A, Garbe E, Brophy JM. **Risk of acute myocardial infarction with NSAIDs in real world use: Bayesian meta-analysis of individual patient data.** *BMJ*. 2017;357:j1909.

Background: The objective of this study was to characterize the determinants, time course, and risks of acute myocardial infarction associated with use of oral non-steroidal anti-inflammatory drugs (NSAIDs).

Methods: Data were obtained via studies from Canadian and European healthcare databases. Data were analyzed using a systemic review followed by a one stage Bayesian individual patient data meta-analysis. Eligible studies were source from computerized drug prescription or medical databases. Drug exposure was modelled incorporating specific NSAID, recency, duration of use, and dose. The outcome measures were the summary adjusted odds ratios of first myocardial infarction for each category of NSAID use.

Results: A cohort of 446,763 individuals including 61,460 with acute myocardial infarction was acquired. Taking any dose of NSAIDs for one week, one month, or more than a month was associated with an increased risk of myocardial infarction. With use for one to seven days the probability of increased myocardial infarction risk (posterior probability of odds ratio >1.0) was 92% for celecoxib, 97% for ibuprofen, and 99% for diclofenac, naproxen, and rofecoxib. The corresponding odds ratios (95% credible intervals) were 1.24 (0.91 to 1.82) for celecoxib, 1.48 (1.00 to 2.26) for ibuprofen, 1.50 (1.06 to 2.04) for diclofenac, 1.53 (1.07 to 2.33) for naproxen, and 1.58 (1.07 to 2.17) for rofecoxib. Greater risk of myocardial infarction was documented for higher dose of NSAIDs. With use for longer than one month, risks did not appear to exceed those associated with shorter durations.

Discussion: All NSAIDs, including naproxen, had an increased risk of acute myocardial infarction. In regards to COX-2 inhibitors which were previously thought to have an increased risk compared to non-selective inhibitors; risk of myocardial infarction with celecoxib was comparable to that of traditional NSAIDs. As previously shown, risk was dose-dependent and increased with higher doses. Interestingly, risk was greatest during the first month of NSAID use in this study and increased risk was shown even at 1-7 days, which is of importance to the ED population. It is important to understand these risks when prescribing NSAIDs to patients with underlying co-morbidities in the ED.