Is kidney-ureter-bladder radiography still a helpful tool to deal with acute ureteral colic in emergency settings? A retrospective cohort study from Palestine

Mohammad Alkarajeh[1]; Mahfouz Ktaifan[1]; Abdoh Abdallah[1]; Amir Aghbar[1,2]; Mosab Maree[1,3]; Sa'ed H. Zyoud[4,5]; Faris Abushamma[1,2]

[1]Department of Medicine, College of Medicine and Health Sciences, An-Najah National University, Nablus 44839, Palestine

[2]Urology Center, An-Najah National University Hospital, Nablus 44839, Palestine

[3]Department of Radiology, An-Najah National University Hospital, Nablus 44839, Palestine

[4]Department of Clinical and Community Pharmacy, College of Medicine and Health Sciences, An-Najah National University, Nablus 44839, Palestine

[5]Clinical Research Center, An-Najah National University Hospital, Nablus 44839, Palestine

corresponding author: Mohammad Alkarajeh, intern doctor at Hebron Governmental Hospital- **Hebron. 0598401413**

Email: mo.alkarajeh@gmail.com

Abstract

Background: Non-contrast computerized tomography (NCCT) has become the standard method to diagnose ureteric stones in emergency settings. The purpose of this study is to identify the reliability of kidney-ureter-bladder (KUB) radiography to be used as a triage tool in acute ureteric colic (AUC). Moreover, this article correlates between KUB and NCCT in view of stone characteristics and clinical outcomes.

Methods and participants: A retrospective cohort study recruited patients who had proven ureteric stones on NCCT. A double-blinded review of KUB and NCCT was performed to identify the following variables in both tests: site, maximal calculi length (MCL), and stone density. Correlation between KUB radiography and NCCT has been performed. The inter-method reliability was used to measure the degree to which test scores are consistent when the methods or instruments employed vary.

Results: One-hundred and fifty-one patients were included, in which 75 (50%) of the patients had negative KUB and positive NCCT for ureteric stones based on the double-blinded review. Lower ureteral calculi were found to be the most common location in both KUB and NCCT images (n=49; 65%, n=81; 54%, respectively). Median MCL of KUB and NCCT were 5 mm (3-8) and 6 mm (4-9), respectively. Hounsfield unit densities of more than 630 were found in 86 (57%), and radiopaque stones were found in 76 (50.3%). There is moderate and significant concordance (Cohen's kappa = 0.520) between NCCT and KUB regarding stone location ($p < 0.01$). There is a strong concordance (Cohen's-kappa = 0.804)

between NCCT and KUB in detecting MCL ($p < 0.01$). Stone density is weakly correlated between KUB and NCCT (Cohen's kappa= 0.254) ($p = 0.001$). Fever, acute kidney injury (AKI), and intractable pain were the main indications for surgical intervention in negative KUB and positive NCCT ureteric stones. MCL and upper ureteric stone were the main predictors of surgical intervention in negative KUB positive NCCT ureteric stone.

Conclusion: KUB radiography should not be used as a triage tool in AUC. However, KUB radiography can be reliably used during follow-up as there is a strong correlation between KUB radiography and NCCT for KUB detectable ureteric stones.