IS BOWEL PREPARATION FOR EXCRETORY UROGRAPHY NECESSARY?

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ABSTRACT

Objective: The objective of this study was to compare the three methods of preparation for excretory urography with regards to image clarity: bowel preparation, together with dietary restriction, dietary restriction alone and no preparation at all.

Study Design: Randomized control trail.

Place and Duration of Study: Department of Radiology, Military Hospital, Rawalpindi, which is a tertiary care hospital. The duration of study was 6 months from Aug 2009 to Feb 2010.

Material and Methods: This was a randomized control trial of 588 patients undergoing excretory urography at a tertiary care hospital. Both male and female consecutive ambulatory patients older than 15 years referred for excretory urography were included in the study. The 588 patients were randomly distributed into three separate groups. Group 1 received standard bowel preparation consisting of tablet bisacodyl in a dose of 30 mg. The patients were instructed to fast for 4 hours before starting the laxative and do drink the laxative drug in the afternoon the day before the examination. Group 2 was instructed to only fast for 12 hours before the examination and the group 3 received no preparation at all. All the three groups were advised not to take breakfast and underwent the same examination procedure and then image clarity was assessed. The images were shown to a single consultant who was blind about the group of the patient and bowel preparatory technique which he or she underwent. Images were regarded clear when pelvicalyceal system, ureters and urinary bladder were demonstrated beyond any doubt. Same contrast agent (urografin) was used in all the three groups in a dose according to body weight (1 mg/kg) to exclude its effects on image clarity.

Results: Assessment of image clarity was done between group 1 and 2, group 1 and 3 and group 2 and 3. The image clarity in patients of group 1 patients was found to be 94.3% and images were unclear in 5.7%. The image clarity in patients of group 2 was found to be 95.4% and the images were unclear in 4.3%. The image clarity in patients of group 3 was found to be 95.1% and images were unclear in 4.9%.

Conclusion: Bowel preparation before excretory urography does not effect the image clarity and should be abandoned.

Keywords: Bowel preparation, Excretory urography, Image clarity

INTRODUCTION

Despite the fact that CT is being commonly employed for evaluation of genitourinary tract and regarded as the investigation of choice for acute flank pains, intravenous urography still has an important role in uroradiology[1,2]. Excretory urography helps in formulation of management of chronic urinary tract infections like tuberculosis[3]. Since urography became established for evaluation of morphology and pathology of urinary tract, it has generally been believed that bowel gas and faeces overlying the kidneys obcure the details of the image[4,5]. So it has been regarded that bowel preparation will improve the quality of subsequent radiographic examinations by improving the visibility of the urinary tract details and thereby image quality[4,5]. Despite the growing evidence of questioning the value of prior bowel preparation, this procedure is being followed in Radiology Departments[1,4]. There is a disagreement about the preparation recommendation amongst the authors of radiological and urological textbooks[1,5]. Some recommend bowel preparation as a routine to visualize small or faintly calcified stones in patients of chronic constipation especially in old age, while others have abandoned the

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procedure[1,4,5]. The image clarity with respect to reproduction of kidney outline in patients with no bowel preparation and in patients undergoing fasting for 12 hours are 36% and 50% respectively[1].

The rationale of the present randomized controlled trial was to find the optimal procedure of bowel preparation for excretory urography for uniform practice, to avoid loss of human resources, cost of medicines and time consumed.

PATIENT AND METHODS

These randomized controlled trials were conducted in Department of Radiology, Military Hospital (MH), Rawalpindi, which is a tertiary care hospital. The duration of the study was 6 months. Both male and female consecutive ambulatory patients older than 15 years referred for excretory urography were included in study. Patients with contraindications to laxatives including small bowel stoma, colostomy and previous colon resection, severe dehydration or marked electrolyte imbalance, a documented allergic idiosyncratic reaction to contrast medium including nausea, vomiting and syncope, patients with serum creatinine values greater than 2 mg/dl, patients with the history of multiple myeloma and with history of intravenous contrast medium administration in previous 48 hours for some other procedure, were excluded from the study. The patients were randomly divided into three groups using random number table. After taking permission from the hospital ethical committee, all the patients fulfilling the above mentioned inclusion and exclusion criteria were enrolled in the study. Excretory urography was performed after taking informed written consent from all the patients.

Data Analysis

Data was analyzed using SPSS version 10. Descriptive statistics were used to describe the data. Chi-square test was used to compare bowel clarity between the groups. *p*-value was 0.9 for the comparison of all the three groups.

RESULTS

A total of 588 patients were included in the study. There were 196 patients in each group of bowel preparation. All the patients underwent the same examination procedure irrespective of their preparation method. Assessment of image clarity was done using chi-square test for comparison between group 1 and 2, group 1 and 3 and group 2 and 3. The image clarity in patients of group 1 was found to be 94.3% and the image was unclear in 5.7% the image clarity in patients of group 2 was found to be 95.4% and the image was unclear in 4.3%. The image clarity in patients of group 3 was found to be 95.1% and image was unclear in 4.9%.

The mean ± SD of age in group 1 was found to be 39.44 ± 11.12 while in group 2 it was 39.8 ± 11.15 and in group 3 it was 39.13 ± 11.02. There was no significant (p value = 0.803) difference in age in the three groups.

The distribution of male and female in all the three groups showed that male patients more than the female patients in all the three groups.

The comparison of the three groups with each other showed that there was no significant difference in the three groups with respect to image clarity (p = 0.9) i.e the rate of image clarity is the same in all three groups.

DISCUSSION

The results of this study showed the equality of image clarity amongst the three groups of bowel preparation and confirm the findings of the previous studies[1-6]. There is a potential source of bias as we do not know how many patients accurately followed our instruction regarding bowel preparation. Though they were amply explained the preparation method through which they had to undergo.

Recommendations to the patients regarding bowel preparation, dietary and fluid restriction before excretory urography are an old tradition in Radiology but the exact origin of such guidelines is not clear in literature review. They were probably formulated as part of guidelines when

type and amount of contrast medium, radiographic equipment and techniques and lack of tomography limited the visualization of the urinary tract[1]. Constipation is a common problem especially in old age and is believed to affect the clarity of the images due to fecal loaded colon; also it is believed that small calculi can be missed in KUB area if loaded with fecal matter but our results and study conducted by Roberge-Wade at al who did a prospective randomized study to determine whether bowel preparation improves the diagnostic quality of images or not proved the same thing that image clarity was not influenced by the method of bowel preparation irrespective of the method of the bowel preparation adopted. Roberge–Wade et al compared two different methods of bowel preparations with fluid restriction alone. There was no difference in the results of the patients who had received two bowel preparations and patients who had received clear fluid only. The results point towards discontinuing the bowel preparation before excretory urography[6].

Bailey et al compared the effectiveness of two methods of bowel preparation with that of no preparation at all, in limiting the amount of fecal matter, seen on kidney/ ureter/ bladder radiographs and found no statistical difference between the groups. This supports the result of our study[7].

The purpose of excretory urography is visualization of urinary tract; kidneys, renal collecting system, ureters and bladder. In this study, to minimize the examiner bias and subjectivity of whether bowel preparation does affect the image clarity or not, the examiner was kept blind to the method of bowel preparation of the patients. Analysis of our results regarding image clarity showed no difference in visualization of images of the patients who had either full bowel preparation, 12 hour fasting or no preparation at all. Effects of different doses of contrast media and preparation of contrast media on image clarity was overcome by administering same contrast agent (urografin) according to body weight of each patient (1 mg/kg).

Our study was relatively confined to ambulatory outdoor patients. We cannot say if the results would be similar for debilitated indoor admitted patients who are at a greater risk of side effects of formal preparation.

Gou H reported that the patients receiving the standard bowel preparation before excretory urography can experience side effects associated with bowel purgation and adds to no advantage as far as image clarity is concerned[6]. This was again supporting our results.

M Jansson used European guidelines score as a standard for evaluation of image clarity. He showed the equality of the three bowel preparation methods, using a standard investigation protocol involving ureteral compression and tomography[1]. The results supported our study.

George A did a prospective study in outdoor patients to find weather bowel cleansing with laxative or dietary restrictions with a liquid supper and fasting after midnight the night before excretory urography are helpful in improving the image clarity, which he found was not the case. So he recommended that bowel preparation should not be conducted as a routine, as it is not helpful in improving the image clarity[7]. This observation supported our study.

Okamura et al found that image clarity with flat panel detector in abdominal imaging was superior to that with film screen, even with a dose reduction of approximately 50%[8]. These flat panel dectors were used in studying the images. The image viewing tools like window and level settings and zoom functions give better representation to even low contrast objects thus further improving the image clarity[1].

Not much of the work supporting this idea has been done in our local setup. So it a routine practice to prepare the bowel before excretory urography in our local setup, despite the growing evidence that it does not improve the image clarity. We think that the image clarity of the urographic examination in no way depends on method of bowel preparation employed before

the study. Our study shows an equality of evaluated preparation methods and cannot justify the further use of bowel preparation before excretory urography, so it is no longer warranted and should be abandoned.

CONCLUSION

Bowel preparation before excretory urography doesn't improve the results and should be discontinued.

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