A PROSPECTIVE TRIAL OF IODIXANOL 270, 320 (VISIPAQUE) IN PATIENTS WITH RENAL IMPAIRMENT (WHO HAS SERUM CREATININE BETWEEN 1.8-3.0 MH/DL.) UNDERGOING COMPUTED TOMOGRAPHY AND INTRAVENOUS PYELOGRAPHY

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OBJECTIVES: This study was designed to determine the nephrotoxicity of iodixanol in patients with renal impairment undergoing computed tomography and intravenous pyelography.

BACKGROUND: Iodixanol, a nonionic, dimeric, iso-osmolar contrast medium (IOCM), may be the alternative use in renal insufficiency patients, as treatment is limited to supportive measures while awaiting the resolution of the renal impairment

MATERIALAND METHODS: The prospective study in patients with high serum creatinine between 1.8-3.0 mg/dl. who are undergoing computed tomography and intravenous pyelography. Most of the patients age are about 50-95 years. Serum creatinine measurement were performed before and after 72 hours (IPD case) or 7 days (OPD case) intravenous injection of Iodixanol. At what level of serum creatinine do radiologists become anxious enough to withhold IV contrast (unless it is essential) -we begin to worry at around 1.7-1.8 and above this, so we design the sample size of patients who have serum creatinine between 1.8- 3.0 mg/dl.

RESULTS: The creatinine concentration increased significantly less in patients who received iodixanol.

CONCLUSIONS: Nephropathy induced by contrast medium may be less likely to develop in high-risk patients when iodixanol is used in patients with high serum creatinine (1.8 - 3.0 mg/dl.) who must be awareness in IV contrast administration use.

Key words: Computed tomography (CT scan), Intravenous pyelography (IVP), Renal insufficiency, serum creatinine, CIN (contrast-induced nephropathy).

INTRODUCTION

Acute renal failure is serious and treatment is costly.[1,2] Nephropathy induced by contrast medium remains one of the most clinically important complications of the use of iodinated contrast medium.[2,3,4,5,6] Most commonly, it is defined as an acute impairment of renal function manifested by an absolute increase in the serum creatinine concentration of at least 0.5 mg per deciliter (44.2 μmol per liter) or by a relative increase of at least 25 percent from the base-line value.[7,8,9,10,11] The serum creatinine concentration typically peaks on the second or third day after exposure to contrast medium and usually returns to the base-line value within two weeks.[6,12] However, renal function may not return to its base-line level,

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contributing to an increased risk of death.[2,12]

The incidence of nephropathy induced by low-osmolar contrast medium is low in the general population and has been calculated to be less than 2 percent.[3] Patients at increased risk include those with renal impairment and diabetes, especially in combination.[8,10,13] In such patients, the incidence is significantly higher, in the range of 12 to 50 percent.[2,4,8,10,14,15,16,17,18] Large clinical studies and meta-analyses have indicated that the use of low-osmolar contrast medium substantially reduces the risk of nephropathy in high -risk patients as compared with the use of high-osmolar contrast medium.[8,9,11,14,19,20]

Iodixanol, a nonionic, dimeric contrast medium, is iso-osmolar to blood at all concentrations, and its level of general toxicity is lower than that of low-osmolar contrast mediums.[21,22,23] Extensive investigations of iodixanol in low-risk patients (patients without diabetes who have normal renal function) have shown no difference between the frequency of nephropathy associated with iodixanol and that of nephropathy associated with low-osmolar contrast mediums.[3,21,24] This absence of difference may reflect the low risk of nephropathy in low-risk patients.[7]

MATERIAL AND METHODS

The prospective study in patients with high serum creatinine between 1.8-3.0 mg/dl. who undergoing computed tomography and intravenous pyelography. Almost patients's age are about 50-95 years. Serum creatinine measurement was performed before and after 72 hours intravenous injection of Iodixanol. Criteria for exclusion were pregnancy, lactation, intravascular administration of an iodinated contrast medium within the previous seven days, treatment with metformin or nonsteroidal antiinflammatory drugs within the previous 48 hours, intake of nephrotoxic drugs within the previous seven days, history of serious reactions to iodinated contrast mediums, newly discovered unstable diabetes, severe concomitant disease, renal transplantation, or end-stage renal disease necessitating dialysis. Written informed consent was obtained from each patient before enrollment.

Patients protocol: Almost patients's age are about 50-95 years. with high serum creatinine between 1.8-3.0 mg/dl. who undergoing computed tomography and intravenous pyelography.

Study protocol: It was designed to determine the renal effects of a nonionic, iso-osmolar, dimeric contrast medium, iodixanol (270, 320 mg of iodine per milliliter) (Visipaque). Each patient was assigned to receive a nonionic, iso-osmolar, dimeric contrast medium. The volume used varied among patients and was not standardized. All patients were to be well hydrated before computed tomography or intravenous pyelography, according to local regimens. It was recommended, but not required, that patients receive 500 ml of water orally, 500 ml of saline intravenously, or both before the computed tomography or intravenous pyelography, followed by 1 liter of 0.9 percent saline or similar fluids intravenously from the start of the procedure.

The follow-up period was seven days. Serum creatinine was measured before examination (at base line, or day 0) and on days 3- 7 according to IPD or OPD patients.

RESULTS

The prospective study in patients with high serum creatinine between 1.8-3.0 mg/dl. who undergoing computed tomography and intravenous pyelography. Almost patients's age are about 50-95 years. There is 55 % reduced in serum creatinine, 36 % increased in serum creatinine and 9 % unchanged serum creatinine. All the results possibly depend on many factors such as patient status (underlying disease), pre-investigation hydrated patient, post -investigation hydrated patient.

DISCUSSION

Contrast-induced nephropathy (CIN), usually defined as an increase in serum creatinine of 44 μmol litre-1 (0.5 mg dl-1) or a 25% increase from the

baseline value 48 hours after intravascular injection of contrast media, is a common and potentially serious complication of the use of iodinated contrast media in patients at risk of acute renal injury. It is an important cause of hospital-acquired renal failure, may be a difficult differential diagnosis and the incidence does not appear to have changed over the last few decades.

In the general population, the incidence of CIN is estimated to be 1-2%. However, the risk for developing CIN may be as high as 50% in some patient subgroups, such as those with diabetes mellitus and pre-existing renal impairment. The impact of CIN on clinical outcomes has been evaluated most extensively in patients undergoing percutaneous coronary intervention where it is associated with increased mortality both in hospital and at 1 yr. As treatment is limited to supportive measures while awaiting the resolution of the renal impairment, emphasis needs to be directed at prevention.

In the general population, the incidence of contrast-induced kidney impairment is less than two per cent. For patients with diabetes and existing renal impairment, the risk is significantly higher - and the number of patients in this high-risk category is growing, due to the increased incidence of lifestyle-related diabetes and the ageing population.

The contrast media affect kidney function is not clearly understood. However, medical literature suggests several factors could be involved, and indicates that osmolality, or the concentration of particles in solution in the contrast agent as opposed to the blood, may be one of the key factors in high -risk patients.

We designed this study in patients who do need IV contrast administration use which we begin to worry about high serum creatinine (1.8 - 3.0 mg/dl). Before nonionic, iso-osmolar, dimeric contrast (Visipaque) is used. We deny IV contrast administration in this high serum creatinine patient group. Some patients were not received computed tomography or intravenous pyelography and may undergoing to explore in surgical case or wait and wait in IPD. In summary, we have found the limitation of the study is the limited number of patients (small sample size) but we hope that this study may be the alternative way of IV contrast used in patient who has high serum creatinine between 1.8-3.0 mg/dl. and do need the IV contrast investigation.

CONCLUSION

Nephropathy induced by contrast medium may be less likely to develop in high-risk patients when iodixanol, a nonionic, dimeric, iso-osmolar contrast medium is used in patients with high serum creatinine (1.8 - 3.0 mg/dl.) who must be awareness in IV contrast administration used.

Alternative way of IV contrast investigation in patients who have high serum creatinine between 1.8- 3.0 mg/dl. is by using Iodixanol, a nonionic, dimeric, iso-osmolar contrast medium to help the clinician to give faster and better treatment to patients while awaiting the resolution of the renal impairment. Increased turn over rate of IPD patients. Reduce the cost of long time hospitalization.

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