# Types of contrast media in radiology

After one year the x-ray were discovered, inspired air became the first recognized contrast agent in radiographic examinations of the chest. The first contrast studies were carried out the upper gastrointestinal tract using bismuth salts on a animal. Barium sulphate and bismuth solutions were being used in conjunction with the fluoroscope, barium sulphate having been used different additives ever since for imaging of gastrointestinal tract. First iodine based contrast used was a derivative of chemical ring pyridine, to which the single iodine atom could be bound in order to render it radio opaque. Iodine based contrast media have been used ever since.

Radiographic contrast has been used for over a century to enhance the contrast of radiographic images. Contrast media (also known as contrast agents) are substances used to highlight areas of the body in radiographic contrast to their surrounding tissue. Contrast media enhance the radio opacity and optical density of the area under investigation so that the tissue or structure absorption differentials are sufficient to produce adequate contrast with adjacent structure. Its enhances the information contained to produced image by the medical diagnostic equipment like traditional and digital radiology, nuclear medicine, ultrasounds, magnetic resonance. When used for imaging purposes contrast media can be administered by injection, insertion or ingestion.

The contrast media is divided into positive and negative. The negative types is which have less absorption and it will be shown up dark or grey. Negative contrast media are radiolucent and it low atomic number. Gases are commonly used to produced negative contrast on radiographic images For examples air or carbon dioxide. Air is the introduced by the patient during

radiographic examination, example when the patient take breath during the chest x-ray. Carbon dioxide is introduced into the gastrointestinal tract in conjunction with the barium sulphate to visualize the mucosal pattern, example double contrast barium meal. The general positive contrast media are which have an increased absorption of x-ray and it will show up the white or grey. These are radio opaque and are of a high atomic number. Barium and iodine based solutions are used in medical imaging to produce positive contrast. Both positive and negative contrast can be employed together in double contrast to produce radiographic image. For examples is iodinates compounds.

Barium sulphate solutions used in gastrointestinal imaging. Characteristics of barium solutions make them suitable for imaging of the gastrointestinal (GI) tract, the characteristics such as high atomic number producing good radiographic contract, stable, insoluble, excellent coating properties of the gastrointestinal mucosa and also relatively inexpensive. Barium suspension composed from the pure barium sulphate mixed additivies and with the dispersing agents, it held in suspension in water. If want to preparing the barium solutions, the important is to check the expiry dates and ensure the packaging is intact. The solutions should be administered at body temperature to improve patient tolerability and its also reduce the spasm of the colon. Barium sulphate solutions are contraindicated with the pathologies, suspected fistula or check anastomosis site, toxic megacolon, paralytic ileus, suspected partial or complete stenosis, prior to sugery or endoscopy.

Iodine based contrast media used in medical imaging. The many of using imaging contrast media at the imaging department are water soluble organic preparations in which molecules iodine are the opaque egent. Its contain, iodine atoms, bound to a carrier molecule. It id for holds the iodine in stable the compound and also to carries it to organ when doing the examination. Iodine based compounds its divided into four types and its depend their molecular structure, the group are ionic monomers, ionic dimmers, non-ionic monomers and non-ionic dimmers.

Contrast media is needed in radiology examination is because, the number of investigation at the radiology will require administration of the contrast into the patient body through the vein or the artery. A example is alike the intravenous urogram (IVU). At the contrast media have a two types of the iodine, there are ionic or non-ionic its regards to chemical structure. Basically , just the bones and the air can see at the film x-ray. If need to delineate the passage urine or the blood flow at the vessels, contrast media that have contained the iodine is use to increase the density of urine or the blood. The results is, the flow of urine or blood will appear white on the film x-ray, its just like the bone on film x-ray.

If want to use the contrast media, the patient have to follow some preparation to do the procedure. Normally, the patient will be asked to fasting, its mean the patient cannot take any food or drink about 4 until 6 hours prior the examination start. But have some condition that patient cannot follow the preparation, the patient must need to take the special precautions and must to beware of slightly risks. The some condition that patient cannot follow the preparation because patient have definite history

of allergy, previous reaction to the contrast media, previous reaction to drug, asthma, heart conditions is not normal, severe diabetes and the contrast media also not encourage to the old people about 65 years above and also for the children about below 6 month. The important for the patient have diabetic andon Glucophage, the patient must to stop the medication 48 hours prior to do the examination requiring intravenous or to get the contrast media injection. The radiographer also must to prepare n aware some condition before doing the examination, the radiographer must related the anatomy, physiology and also pathology. Also correct choice and disposal of any equipment to used. Must know the criteria for choosing the vein and know the potential problems if it will be happen.

From the contrast media also, the patient still can get the some risk, but the reaction of risk are extremely low. At the first, the doctor must tell the patient about the benefits of contrast media and also the risk. The contrast media is like the drug that the all people know and familiar with. But, the new of iodine that containing contrast media are very safe. Event though, the contrast like the all drug its also including panadol, there still have the potential risk reaction to the contrast media. Its classified into three types, which is mild, moderate and also severe. If the contrast media is non-ionic, the reactions is will be reduced. The reactions most are no treatment will require, mild, and transient, it majority will be occur within first 20 minutes after the injection. Mild reaction simply require careful observation of the patient. The symptoms of a mild reaction is nausea, a warm feeling that may be associated with hot flushing, pallor, a metallic taste in mouth, sneezing, rhinorrhoea, itching and sweating. Treatment of mild reactions usually only

involves observation of the patient and reassurance. At the moderate, this is a more severe reaction in which medical treatment is necessary. The include symptoms is pruritis, chest pain, erythema, abdominal pain, vasogal syncope, abdominal pain. The treatment of moderate reaction may vary. Compression and tight clothing should be released and the patient reassured. Severe reaction is need to find the medical advice immediately. The management of severe adverse reaction, include the drug treatment, it should be handle by the resuscitation team. The symptoms may be include is pulmonary oedema, anaphylactic shock, cardiac arrest, respiratory arrest, cerebral oedema, paralysis, seizures. Its is important to radiographer to recognizes the symptoms. The administration of oxygen by mask (6-10 l/m) is vital and it should administered as soon as possible. Treatment of a severe reaction should follow the ‘ ABCD system’, the system is airway open, breathing restored, circulation maintained, drug and definitive therapy.

Any patient take the contrast media have the potential to develop any complications, the example of the complications is pain, allergy, extravasation, vasovagal response, emboli, unintended arterial cannulation, phlebitis and thrombophlebitis. The tissue damage from the extravasation of contrast is by the direct toxic effect. Its usually faster to absorbed. Compartment syndrome may shown when swelling takes place within a compartment of limb and increase and ot pressure on the arteries, nerves and vein.

The contrast media help the doctor to diagnosed problems at the patient more easily. But contrast media should never be injected by anyone unfamiliar with the procedure. Contrast media not only used at general x-

ray, but used in other radiographic examination, at biliary and hepatic imaging, and also used in ultrasound.