**Model SOP**

**Standard Operating Procedure**

**Name of the facility / activity : Transfusion Reaction Workup**

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| --- | --- | --- | --- | --- |
| **SOP no.** | **Effective Date** | **Pages** | **Prepared by** | **Authorised by** |
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| **LOCATION :** Red Cell Serology Laboratory | | | | |
| **SUBJECT** : Transfusion Reaction Workup | | | | |
| **FUNCTION :** To identify cause of transfusion reaction. | | | | |
| **DISTRIBUTION**: Supervisor in charge of Red Cell Serology Laboratory  Master File | | | | |

1. **SCOPE & APPLICATION:**

This Standard Operating Procedure (SOP provides the protocol to be followed to identify the cause of an adverse transfusion reaction and prevent its reoccurrence).

1. **RESPONSIBILITY:**

It is responsibility of the technician in the Red Cell Serology Laboratory to accept the blood/component implicated in the transfusion reaction which is returned from the ward/OT. It is the duty of the same technician to ensure that there is documented evidence of the nature of reaction either on the transfusion request form or on a separate letter addressed to blood bank, along with the post-transfusion blood sample (both EDTA and clotted) and urine specimen, if necessary. The direct antiglobulin test (DAT) should be performed on the post-transfusion EDTA sample immediately on receipt before refrigeration. The unit and samples should be preserved properly and handed over to the advanced red cell serology technician who is responsible for detail investigation.

1. **MATERIAL REQUIRED:**

**Equipment:**

* Refrigerator to store samples and reagents at 2 – 60C
* Deep Freezer to store enzyme papain-cystein in frozen state.
* Table Top Centrifuge.
* Automated Cell washer
* Microscope.
* Dri bath / Incubator.

**Specimen:**

* Blood/component bag returned room ward/OT.
* Patient’s pre-transfusion blood sample(clotted).
* Patient’s post-transfusion blood sample (EDTA and clotted).
* Patient’s post-transfusion urine sample.

**Reagents:**

* ANTI-a, Anti-B, Anti-AB Antisera.
* Group A,B &O pooled cells.
* Papain-cystein/22% Bovine albumin.
* Antihuman globulin reagent(anti-IgG anti-C3d)
* IgG Sensitised Control Cells.
* 0.9% Saline.
* Distilled water
* 30g/l sulfosalicylic acid solution.
* Ammonium Sulphate {NH4(so4)2}.

**Glassware:**

* Serum tubes.
* Coombs’ tubes(for patient grouping only).
* Micro tubes.
* Pasteur pipettes.
* Glass slides.
* Small funnel.
* 20ml test tubes.
* 5ml pipette.

**Miscellaneous:**

* Rubber teats.
* Disposal box.
* 2 plastic beakers.
* Wooden block to hold micro tubes.
* Aluminium racks to hold serum and coombs’ tubes.
* Whatmen No.1 filter paper.
* 5ml plastic vial with screw cap.

1. **PROCEDURE FOR TRANSFUSION REACTION WORKUP**

**General Instructions**

1. All reported transfusion reactions to be regarded as emergencies.
2. Following things should be asked for investigation.
3. Implicated blood bag along with the transfusion set.
4. 5 ml EDTA post Tx blood sample.
5. 5 ml clotted post Tx blood sample.
6. 1st post Tx urine sample.
   * + 1. 2.7 ml blood in citrate vial (0.3 ml citrate) for coagulation screen (PT, PTTK, and TT) to be sent to pathology lab till faculty is available at our Dept.
       2. Completed transfusion reaction workup request form.
7. Forms + samples should be received by persons at reception & entered in register. He should also take out requisition form pre Tx patient and donor sample from Cross match rack.
8. During departmental working hours resident posted in immunohaematology will work up the investigation & during emergency Technician on duty will work up and inform the concerned faculty.
9. **Following approach should be followed systematically and results recorded on   
   laboratory worksheet :**

**Flow chart of laboratory approach to work up of Transfusion reaction.**

|  |  |  |
| --- | --- | --- |
| **Clinical** | **Serological** | **Microbiological** |
| 1. Check records.  - Pre Tx (requisition form)  - Post Tx (tested)  - Compatibility report  2 Check labels  - Blood bags  - Blood sample  PreTx  Post Tx | 1. Observe plasma for Hb in  post Tx EDTA sample after  centrifugation.  2. Wash cells & perform  DAT.  3. Repeat blood grouping  including sub typing and  cross matching with pre &  post Tx patient sample and  donor sample using saline,  albumin, IAT and enzyme  technique.  4. Perform antibody  screening on patient and  donor serum sample. | 1. Blood culture at 40 C, 220  C & 37° C from blood bag,  tubing & recipient post Tx  sample for bacteria & fungi. |

**Haematological / Other**

* Complete blood count.
* PB Smear for spherocytes & crenated cells.
* Coagulation screen (PT, PTTK, TT)
* Screen for FDP.
* Urine for Hb, Microscopy S Bilirubin.

1. 10th Day Post Tx pts sample (If pt not getting expected Tx benefit (Hb) or Jaundice) For
2. Antibody screening by various methods.
3. Bilirubin estimation.
4. Serial Hb/Het & haptoglobin.
5. Plasma Hb.
6. Coagulation screen.
7. Hemolytic Tx reaction due to mismatching can be identified by :
8. Clerical check which reveals clerical error.
9. Hemolysis in post Tx sample may be seen.
10. DCT is positive in post Tx blood sample but negative in Pre Tx sample or
11. When both pre & post Tx specimens have positive DCT but the reaction of   
    post Tx specimens is stronger than pre Tx specimen.

**RESULTS**

If Clerical error identified identify

(a) Level of error

* Sample collection is ward.
* Wrong grouping/wrong reporting in Tx lab on patient or donor sample error a   
  identifying the recipient in ward.
* Non immune hemolysis
* No blood group incompatibility.
* Blood is bag hemolysed.

(b) Stop the release of blood to all patients & check records of other pts & donors   
on that particular day.

1. **DOCUMENTATION:**
2. Enter the transfusion reaction in blood issue register, showing date and time of return of the unit and nature of reaction.
3. Enter the DAT/IAT results in the Antiglobulin test book in the red cell serology laboratory.
4. Document the results of the entire investigations in the Transfusion Reaction work – up form.
5. Keep record in the Transfusion Reaction Record Register in advanced red cell serology laboratory.

1. **References :**
2. Introduction to Transfusion Medicine: Zarin Bharucha and D.M. Chouhan – 1st Edition, 1990. Pages 216-219.
3. **END OF DOCUMENT.**

**Appendix II**

**TRANSFUSION REACTION WORK UP REQUEST FORM**

***I Patients Details***

Patient's Name --------------------------------- Age / Sex --------------------------

Ward / Bed CR no. C /I

Blood group (as per record) Resident in charge

Clinical diagnosis \_

***II Transfusion Details***

Component transfused blood/platelet/plasma/cryoprecipitate   
Unit No. ---------------------------------------------------

Date of time & issue -------------------------------------

Date & time of starting transfusion

Date & time of reaction \_

Date of expiry \_

Amount of Blood transfused -------------------------------------------------ml.

Blood/component was stored in Freezer/Refrigerator/Room Temp.

HO warming Yes / No

Method of warming Water Bath/Microwave/37° C Incubator/direct heater

HOInjection in bag of drugs specify: saline/dextrose/distill water/Ringer's lactate

***III Patient's HistorylExamination***

H/O previous Transfusion: Yes / No

If yes : Date No. of Units \_

Obstetric history HOAtypical Ab m serum

Pre Transfusion Hb level Indications for Tx

Vol. Of urine passed (post Transfusion) \_

Pre Tx Post Tx Present

* Pulae
* BP

• R/R

• Temperature

Type of reaction : Immediate / Delayed:

Type of reaction : Immediate *I* Delayed:

Fever Chills Rigors Rash \_

LumbarPain Tachycardia Hypertension \_

Vorrriting Hemoglobinuria \_

Jaundice Oozing from Puncture marks \_

***Please send to blood centre along with the completed form:***

1. Blood unit with Tx set.
2. 5 ml EDTA Post Tx patients sample.
3. 5 ml clotted Post Tx patients sample.
4. Citrated blood sample (2.7 m1 to 0.3 ml citrate).
5. 1st post Tx urine sample for Haemoglobinuria.