Research Paper Medical Science

Vancomycin Induced Red Man Syndrom

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KEYWORDS

CASE HISTORY
34 years female patient reported for having chief complains of-

- Flushing of face
- Hypotension
- Tachycardia
- Headache

Within an hour of rapid iv infusion of inj. Vancomycin 500mg
- On Examination
- BP - 80mm hg systolic
- Pulse – 140/min
- RR – 36/min
- Patient was conscious but agitating

RELEVANT MEDICAL HISTORY
- Patient came on 09/03/2013 with c/o
- Fever with chills
- Burning micturition
- Vomiting
- Generalized weakness
- Malaise

Since 7 days

Patient was admitted for the same on 09/03/2013
- BP – 120/70 mm hg
- Pulse – 84/min
- DRUG HISTORY

DRUGS	STARTED ON	STOPPED ON
Inj. Artesunate (120mg) iv OD	09/03/2013	continued
Inj. Ceftriaxone (1gm) iv BD	09/03/2013	continued
Inj. Ondensatron (4mg) iv OD	09/03/2013	continued
Inj. Pantoprazole (40mg) iv OD	09/03/2013	continued
Inj. Vancomycin (500mg) iv infusion	10/03/2013	10/03/2013

INVESTGATIONS
- TLC – 12,500/cumm
- Hb – 9.6 mg%
- USG – mild hepatomegaly
- PS for MP - negative
- Other laboratory parameters were within normal limits.

MANAGEMENT
- Inj. Avil 2cc iv stat
- Inj. Hydrocortisone 100mg iv stat
- Inj. Dopamine iv infusion
- Inj. Calcium gluconate iv stat
- I.V. fluids

OUTCOME – "Recovered"
- Pt. improved symptomatically
- Flushing releaved
- BP – 110/70 mmhg
- Pulse – 86/min

CAUSALITY – " Probable"
- Temporal relationship present
- Dechallange positive

Vancomycin is a glycopeptide antibiotic discovered in 1956
- Against MRSA
- Acts by inhibiting bacterial cell wall synthesis.
- High systemic toxicity

Side effects
- Infusion-related events- Red man syndrome Hypotension, Nephrotoxicity, Ototoxicity
- Hematopoietic – Reversible neutropenia, Rarely thrombocytopenia, Reversible agranulocytosis
- Phlebitis
- Drug rash with eosinophilia and systemic symptoms (DRESS)

VANCOMYCIN INDUCED RED MAN SYNDROME
- Most common
- "red-man", "red man's", "red neck" or "red person's syndrome"
- Despite the replacement of the old formulation of vancomycin, termed "Mississippi mud" due to impurities, the newer and purer vancomycin product still causes toxicities, including RMS.
- RMS is a form of pseudoallergic drug reaction

Or
- ADR mimic immunologic drug allergies, BUT in which immunologic mechanisms have not be demonstrated.
- RMS can also be seen with other antibiotics [e.g. Ciprofloxacin, Amphotericin-b, Rifampicin and Teicoplanin] or other drugs which releases histamine.
- The incidence 3.7% - 47% in infected patients
- 5–13% of patients when the infusion is given over less than 1 hour
- Flushing, erythema, and pruritus (Upper body, neck, and face)
- Pains and muscle spasms in the back and chest
- Dyspnea and hypotension
- Sensations of burning and itching
- Agitation
- Dizziness
- Headaches
- Chills, fever
- Perioral paresthesia
- Hypotension in isolation has been reported

- RMS is rarely life-threatening, although severe cardiovascular toxicity and even cardiac arrest have been reported

MECHANISM
- Best classified as - *idiopathic infusion reaction*
- Resembles IgE-mediated anaphylaxis
- BUT does not involve drug-specific IgE.
- Studies in animals indicate that vancomycin directly activates mast cells, resulting in release of vasoactive mediators, such as histamine

PREDISPOSING FACTORS
- Mast cells may be more easily activated by vancomycin when certain other medications are also present which enhances dose or rate-related mast cell degranulation
- Opioids (e.g. Morphine, Meperidine, Codeine)
- Radiocontrast dyes,
- Some smooth muscle relaxants

Relationship To Infusion Rate
- Rapid infusion rate is the most common cause of RMS
- The infusion rate of 33 mg/min (1 gram over 30 minutes) causes RMS symptoms in most subjects
- Whereas slower rates of 10 mg/min (corresponding to 1 gram over 1.67 hours) or less rarely cause symptoms
- Vancomycin should be infused over a minimum of 100 minutes or at a rate no higher than 10 mg/min, whichever results in a slower infusion.

Prevention Of Initial Reactions
- Empiric premedication to prevent RMS is not usually necessary for the first time at standard rates of infusion (≤10 mg/min).
- Advise even slower rates of infusion for patients who are also receiving opioids or other medications that predispose to mast cell activation.
- Commonly employed if more rapid infusions of vancomycin are required in emergency or presurgical settings.
- Oral premedication with H1 or H2 antihistamines

Diphenhydramine (≤1 mg per kg)
Cimetidine (≤4 mg per kg),

MANAGEMENT
Mild To Moderate Reactions:-
- Interrupt the infusion,
- Diphenhydramine (50 mg orally or intravenously)
- Ranitidine (50 mg intravenously)
- Infusion can then be restarted at one-half the original rate

Severe Reactions:-
- Stop the infusion
- Diphenhydramine (50 mg intravenously)
- Ranitidine (50 mg intravenously)
- IV fluids if hypotension is present
- The infusion can be restarted, and given over four or more hours.
- For future doses - repeat premedication with antihistamines before each dose and infusion over four hours.

Recurrent Reactions
- These individuals may have mast cell and/or basophils that are easily activated.
- Desensitization can be attempted in such patients if vancomycin is absolutely required.
- Desensitization induces clinical "tolerance" to an agent when IgE-mediated mechanisms are responsible
- The mechanism by which desensitization might work in non-IgE mediated reactions is not known.
- We acknowledge the Medicine dept. for their support & efforts.

REFERENCES

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