Nursing Implications in the Use of Nesiritide: A Retrospective Study

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Problem

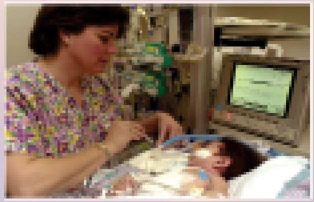
Nursing practice is improved when evidenced-based studies and findings guide protocols. These protocols provide direction in effectively managing common patient care issues. Cardiac care nurses must keep abreast of current medications in order to effectively care for their critical patients. Nesiritide (BNP, Natrecor) is the first new drug in over a decade to be approved by the FDA for the treatment of acute congestive heart failure. There are only two published pediatric case reports in the use of Nesiritide to date. There are currently no published research studies in relation to the nursing implications in the use of Nesiritide. Three CVICU nurses recognized the increased use of this drug in their patient population and deficiency of nursing guidelines. A retrospective chart review study was conducted with the purpose of determining an evidenced-based approach for the implications of nursing practice in the use of Nesiritide.

Nesiritide (BNP, Natrecor®)

First NEW drug in over a decade to be FDA approved for treatment of acute decompensated CHF (August 2001).

Literature Review

- Multi-center Study:
  432 pts: Placebo vs. Nesiritide dose
- VMAC Study:
  489 pts: Nesiritide vs. NTG vs. Placebo
- Case Report: Gainesville
  Bridge to transplant (4 pts.)
- Pediatric Case Reports:
  University of Missouri (5 pts.)
  Emory University (2 pts.)
  Children's Hospital of Orange County
  (unpublished 3 pts)



Nesiritide vs. Dobutamine and Milrinone

	Nesiritide	Dobutamine	Milrinone
Inotropic	No	Yes	Yes
Chronotropic	No	Yes	No
Vasodilating	Yes	No	Yes
Diuretic	Yes	No	No
Arrhythmogenic	No	Yes	Yes
Increases myocardial O_2 consumption	No	Yes	+/-

Retrospective

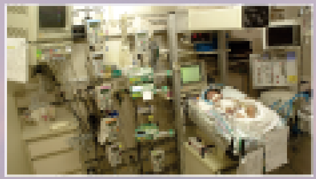
Retrospective Chart Review:
Study Population

- Ten patients: Ages 3 days – 13 yrs.
  June – October 2004
- Seven: cardiac surgery candidates
- One: chronic renal failure, etiology unknown
- Two: transferred for potential cardiac transplant (13yr old with cardiomyopathy, unknown etiology and 17 day old with biventricular failure)
- Since chart review study conducted an additional 5 patients have been placed on Nesiritide

Study Findings

Study Findings and Recommendations

- Inconsistent charting:
  Physical assessment, vital signs, urine output
- Inconsistent drug administration:
  Bolus, dosing, titration
- Conclusion: New FDA approved drug
  Need for staff education:
  Nursing and monitoring guidelines



Implications

Nursing Implications in the Use of Nesiritide

Nesiritide (Natrecor): Human B type natriuretic peptide that binds to granulate cyclase receptor of vascular smooth muscle and endothelial cells, leading to increased cGMP and smooth muscle relaxation. cGMP serves as a second messenger to dilate veins and arteries.
- Decreases pulmonary capillary wedge pressure and systemic arterial pressure
- Suppresses the renin-angiotensin-aldosterone system

Dosage and Administration:
- IV bolus dose – 2mCg/kg over 60 seconds
- Starting dose for continuous infusion – 0.01 mCg/kg/min
- Maximum continuous infusion – 0.03 mCg/kg/min
- Increase rate by 0.005 mCg/kg/min (preceded by a rebolus of 1 mCg/kg) every 2-3 hours

Onset of Action: 15 minutes
Peak: One hour
Duration: > 60 minutes (up to several hours)
Half-life: 18 minutes
- Reaches steady state in 90 minutes
- Hypotensive effects can last up to 2 hours

Elimination: Cellular internalization proteolytic clearance of the peptide by endopeptidases and renal filtration (dosing does not need to be adjusted for renal failure)

Compatibility: Normal Saline, 1/2NS, 0.2%NS, D5W, or D10W
- Replace Nesiritide syringe every 24 hours

Incompatibilities: Heparin, Insulin, Edecrin, Bumex, Enalapril, Hydralazine, and Lasix
- Precaution in using with heparinized line; may bind with Heparin in tubing and alter amount of drug delivered

Adverse Reactions: Hypotension, headache, nausea, and back pain

Contraindicated: Cardiogenic shock, low cardiac filling pressures, hypersensitivity, significant valvular stenosis, restrictive cardiomyopathy, and constrictive pericarditis

Evaluation Criteria

1). Hourly documentation:
  a. urine output
  b. peripheral perfusion
2). SBP, RAP, CI, PCWP
  Documented every:
  a. 15 minutes during titration
  b. up to 2 hours after last dose change
  c. then hourly at a minimum
3). Initial bolus: followed by 0.01mCg/kg/min infusion
4). Dose range: 0.01 mCg/kg/min.
5). Titrated by:
  a. 0.005mCg/kg/min
  b. every 2-3 hours
6). D5W, NS, ½NS, 0.2%NS, or D10W reconstitution
7). Nesiritide syringe changed every 24 hours
8). Document: Cardiac filling pressure
  Adequate
  Inadequate
  Interventions and outcomes

Outcomes

CVICU implemented a standard of nursing care for pediatric patients receiving Nesiritide. A three month retrospective chart review will be conducted to evaluate nursing implementation and patient outcomes. Results will determine the need for further education and/or guideline modification. If documentation reflects evidence of consistent care, then further nursing guidelines will be proposed.

References

[illegible] The New England Journal of Medicine [illegible]
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