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Summer 7-25-2017

### Neuroleptic Malignant Syndrome

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#### Recommended Citation

Moomaw, Melissa, "Neuroleptic Malignant Syndrome" (2017). *Nursing Student Class Projects (Formerly MSN)*. 209.

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# Neuroleptic Malignant Syndrome

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## Intro/Overview

- Identified in France during the 1960's as *Syndrome Malin Des Neuroleptiques* (Gall-Ojurongbe, & Williams, 2015).
- NMS is a rare, **life threatening** reaction to antipsychotic therapy.
- Associated with 1<sup>st</sup> and 2<sup>nd</sup> generation antipsychotics, atypical antipsychotics, and centrally acting antiemetic agents (Al Danaf, Madara, & Dietsche, 2015).
- Cardinal features: 1. altered mental status 2. muscular rigidity 3. hyperthermia, 4. dysautonomia (Drews & Evans, 2017).
- Estimated incidence of 0.02% to 3.23% (Wilson, Hayden, & Nordstrom, 2016).
- Mortality rate 4%-30% (Waldorf, 2003).

## Pathophysiology

- Hypothesis of *Hypodopaminergic Tone*: inhibition of dopamine receptor activity in the CNS (Belvederi Murri, Guaglianone, Bugliani, Calcagno, Respino, Serafini, & Amore, 2015).
- Neuroleptic medications gain their therapeutic effect from blocking dopamine receptors.
- Usually develops within the first 2 weeks of treatment, but can develop at any time during the therapy period (Gall-Ojurongbe & Williams, 2015).
- Occurs in all age groups; elderly may be at higher risk due to coexisting medical conditions; men affected = women affected; no genetic link (Waldorf, 2003).



Figure 1: Genesis Theme Framework. Dopamine, <http://www.naturallivingideas.com/boost-dopamine/>

## Significance of Pathophysiology

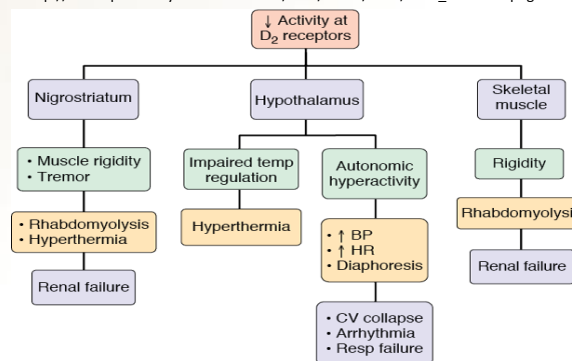
- There is NO gold standard, diagnostic test available.
- NMS confirmed by clinical presentation, and exclusion of other causes.
- Differential diagnostic considerations: Malignant Hyperthermia, pheochromocytoma, thyroid storm, serotonin syndrome, lethal catatonia, acute porphyria, tetany, encephalitis, brain lesions and tumors, sepsis, heat stroke, and drug use (Waldorf, 2003).

## Signs/Symptoms

\* Decreased levels of Dopamine are responsible for the tetrad of cardinal features presented in NMS.

- 1). Muscular rigidity: ↓ dopamine in the nigrostriatal pathway (Waldorf, 2003).
- 2). Altered mental status: hyperpyrexia and ↓ dopamine in reticular activating system (Waldorf, 2003).
- 3). Hyperthermia: ↓ dopamine in hypothalamus and overproduction of heat secondary to extreme muscle rigidity (Gall-Ojurongbe & Williams, 2015).
- 4). Dysautonomia: dopamine receptor blockade in hypothalamus → instability (Waldorf, 2003).

Figure 2: Internal Medicine: A Guide to Clinical Therapeutics, [http://accesspharmacy.mhmedical.com/data/books/attr1/attr1\\_c044f002.png](http://accesspharmacy.mhmedical.com/data/books/attr1/attr1_c044f002.png)



Source: Atrudge RL, Miller ML, Moote R, Ryan L. *Internal Medicine: A Guide to Clinical Therapeutics*. www.accesspharmacy.com. Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

- 2° signs/symptoms: liver and kidney failure; hyperkalemia; leukocytosis; rhabdomyolysis; venous or arterial blood clots, acidosis, and hypoxia (Ojurongbe & Williams, 2015).

## Nursing Implications

- Number of people taking antipsychotics/neuroleptic medications is on the rise.
- Advanced practice nurses (APNs) may be the one prescribing these medications and RN's will be administering them → imperative to recognize the s/s associated with NMS.
- Important to know how to treat NMS:
  - IMMEDIATELY stop medications
  - Supportive care: control temperature, restore fluid/electrolyte balance, give a muscle relaxant such as Dantrolene, and stimulate dopamine production with Bromocriptine (Waldorf, 2003).
- EDUCATE EDUCATE EDUCATE!

## Conclusions

- Although the incidence of NMS is low, it may be fatal if early recognition is delayed!
- Can be difficult to Dx d/t multiple complicating and confusing factors associated with its presentation.
- Knowledge of pharmacology, a good history of medication use, and quick identification of s/s in mild cases can prevent occurrence and progression to lethal outcomes (Belvederi Murri, et al., 2015).
- Goal = ↓ mortality



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