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Underutilization of Therapeutic Hypothermia After Sudden Cardiac Arrest in United States: A 10 Year Perspective

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Underutilization of Therapeutic Hypothermia After Sudden Cardiac Arrest in United States: A 10 Year Perspective

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Background

- In 2002, International Liaison Committee on Resuscitation recommended that unconscious adults patients with spontaneous circulation after an out of hospital ventricular fibrillation (VF) arrest receive cooling to 32°C to 34°C for 12-24 hours.
- Therapeutic hypothermia (TH) improves neurologic outcomes in resuscitated cardiac arrest (CA) patients.
- Institution of therapeutic hypothermia is a Class I indication after a VT/VF cardiac arrest and a Class IIb indication after a non-VT/VF arrest.
- Our aim was to examine trends and predictors of therapeutic hypothermia utilization after cardiac arrest using a large national database.

Methods

- NIS is nation's largest all payer database, approximating a 20% stratified national sample.
- We searched NIS from 2002 to 2011 for all patients >18 years age with cardiac arrest (CA) using ICD-9 codes 427.5 & V12.53 in any diagnoses fields.
- Therapeutic hypothermia was identified using ICD-9 procedure code 99.81.
- Chi-square test for trend was used to identify trends in TH utilization over the years.
- Logistic regression models were created to identify the predictors of TH utilization.

Results

- 2,300 out of 297,522 (0.77%) patients underwent TH.
- Mean age of patients with TH was 60.9 ±16.0 years.
- Mean age of patients without TH was 67.1 ±16.2 years.
- 38.7% females in TH group compared to 45.6% females in no TH group.
- 74.4% Caucasians & 12.3% African Americans in TH group compared to 69.2% Caucasians & 16.1% African Americans in no TH group.

Table 1. Predictors of Utilization of Therapeutic Hypothermia in Patients Presenting With Cardiac Arrest

Predictor	OR	95% CCI	p value
Age >65 years	0.59	0.53-0.65	<0.001
Female gender	0.85	0.78-0.93	<0.001
Acute myocardial infarction	1.69	1.54-1.85	<0.001
Deyo-Charlson Score*			
2	0.90	0.81-1.01	0.07
3 or more	0.87	0.79-0.96	0.006
Primary Payer€			
Private insurance	1.24	1.11-1.37	<0.001
Self-pay/Other	1.33	1.15-1.53	<0.001
Teaching hospital	1.19	1.10-1.30	<0.001
Large hospital bed size	1.34	1.22-1.47	<0.001
Hospital Region£			
Midwest	0.86	0.76-0.98	0.021
South	0.55	0.49-0.62	<0.001
West	1.25	1.10-1.41	<0.001

(*Deyo Charlson Score 0-1 considered as referent, €Medicare/Medicaid considered as referent, £ Northeast Hospital Region considered as referent)

Results



Figure 1: Trend of therapeutic hypothermia utilization from 2002-2011 (p<0.001)

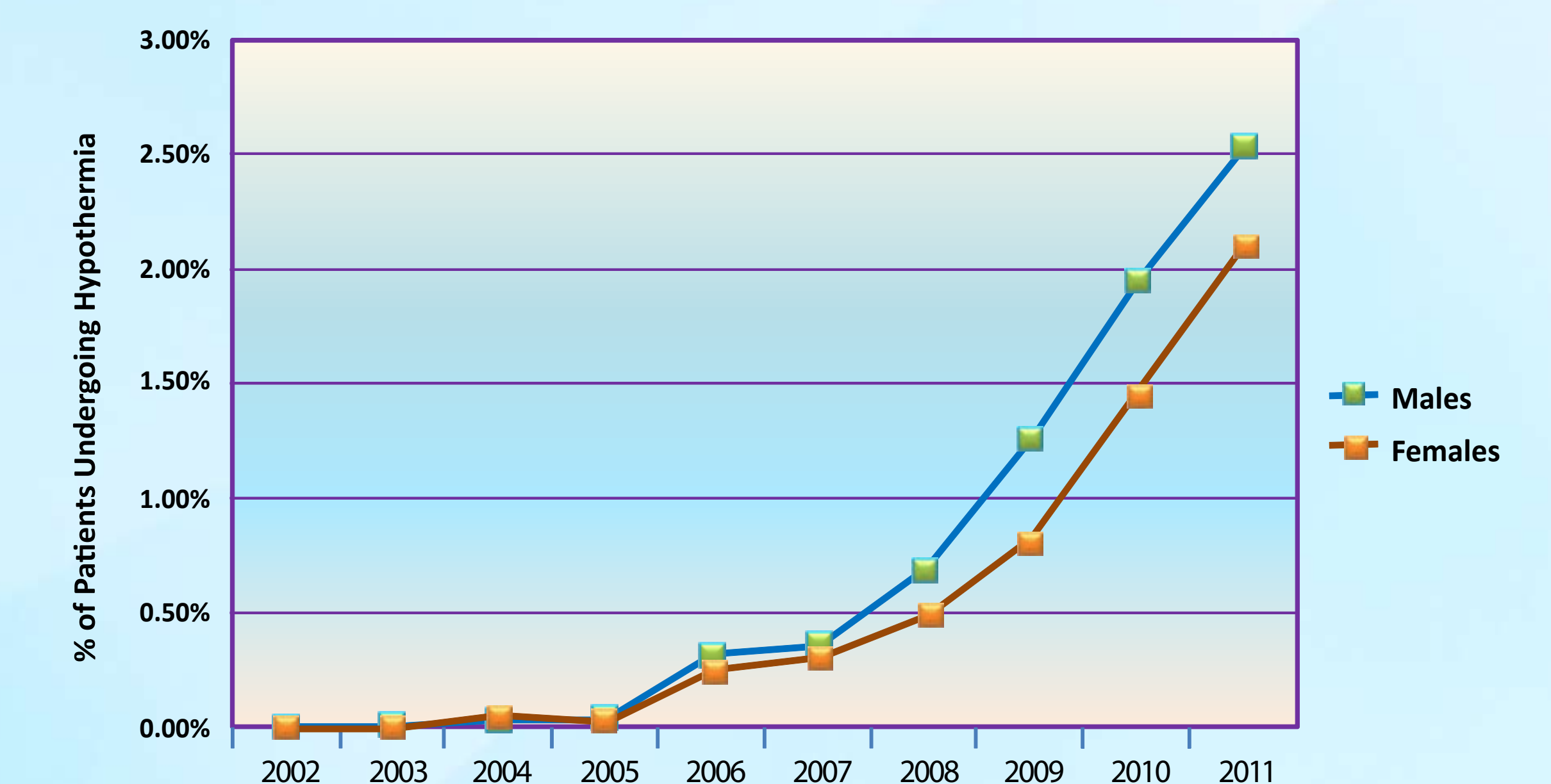


Figure 2: Gender differences in utilization of therapeutic hypothermia from 2002-2011

Conclusions

- Inability to determine shockable rhythm or eligibility of therapeutic hypothermia at presentation is a major limitation of the database. This may result in underestimation of utilization rates.
- Hypothermia is less likely to be utilized in women, older patients & in those with multiple comorbidities.
- Need to explore reasons for gender differences.

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