Marriage is associated with lower mortality rates in patients with acute coronary syndromes and modifiable cardiovascular risk factors

Dr Paul Carter
ACALM Study Unit, Aston University
Cardiology Academic Clinical Fellow, Cambridge University

Dr Rahul Potluri
Founder of ACALM Study Unit and Senior Clinical Lecturer, Aston University

No funding or declarations of interest
Background

- Ischaemic heart disease is the leading cause of mortality worldwide.
- IHD is influenced by a wide range of biopsychosocial factors.
- Marriage has previously been associated with lower mortality rates.
- Modifiable cardiovascular risk factors account for a large proportion of IHD, but the extent to which they are controlled is variable.
- Sociodemographic factors, such as marital status, could play an important role in this undermanagement of risk factors.
Aim

“Does marital status affect survival rates in patients with the main risk factors for heart disease, and, in patients who have had a heart attack?”
Key Points about Methods

• Big data approach using ACALM (Algorithm for Co-morbidities, Associations, Length of Stay and Mortality) Study Unit

• Of over 1 million patients admitted to multiple hospitals in North West England over 14 year period between 2000-2014 we studied those with:
  – Hypertension
  – Hyperlipidaemia
  – Type 2 Diabetes
  – Acute Coronary Syndrome

• Mortality rates were studied for patients of different marital statuses

• Statistical analyses adjusted for age, gender, ethnicity and the top 10 contributors to mortality in the UK.
The Study Groups

Breakdown of Marital Status by Cardiovascular Condition

- Hypertension (n=168,431)
  - Single: 11.0%
  - Married: 5.4%
  - Divorced: 18.4%
  - Widowed: 0.0%
  - Common Law: 15.2%
  - Unmarried: 1.2%
  - Separated: 0.6%
  - Unknown: 1.2%

- Hyperlipidaemia (53,055)
  - Single: 10.4%
  - Married: 4.4%
  - Divorced: 15.8%
  - Widowed: 0.0%
  - Common Law: 20.5%
  - Unmarried: 1.1%
  - Separated: 1.0%
  - Unknown: 1.0%

- Type 2 Diabetes (n=68,098)
  - Single: 12.4%
  - Married: 5.3%
  - Divorced: 16.5%
  - Widowed: 0.0%
  - Common Law: 16.5%
  - Unmarried: 14.2%
  - Separated: 1.3%
  - Unknown: 0.8%

- Acute Coronary Syndrome (n=25,287)
  - Single: 10.0%
  - Married: 11.0%
  - Divorced: 11.0%
  - Widowed: 11.0%
  - Common Law: 11.0%
  - Unmarried: 11.0%
  - Separated: 11.0%
  - Unknown: 11.0%
Results: Impact of Marital Status on Mortality

Increased Mortality

Reduced Mortality

Cardiovascular Comorbidity

HTN = Hypertension  HL = Hyperlipidaemia  T2DM = Type 2 Diabetes  ACS = Acute Coronary Syndrome
Results: Impact of Marital Status on Mortality

- Increased Mortality
- Reduced Mortality

Odds Ratio for All-cause Mortality (OR, 95% CI)

Cardiovascular Comorbidity:
- HTN = Hypertension
- HL = Hyperlipidaemia
- T2DM = Type 2 Diabetes
- ACS = Acute Coronary Syndrome

HTM = Hypertension

ESC CONGRESS
BARCELONA 2017
#esccongress
www.escardio.org/ESC2017
Results: Impact of Marital Status on Mortality

- Increased Mortality
- Reduced Mortality

Cardiovascular Comorbidity:
- HTN = Hypertension
- HL = Hyperlipidaemia
- T2DM = Type 2 Diabetes
- ACS = Acute Coronary Syndrome
Results: Impact of Marital Status on Mortality

- Married vs Single: Reduced Mortality
- Widowed vs Single: Increased Mortality
- Divorced vs Single: Increased Mortality
- Divorced vs Married: Increased Mortality

Cardiovascular Comorbidity:
- HTN = Hypertension
- HL = Hyperlipidaemia
- T2DM = Type 2 Diabetes
- ACS = Acute Coronary Syndrome

Increased Mortality

Reduced Mortality
Results: Impact of Marital Status on Mortality

1) Reduced mortality in married and widowed patients

Married vs Single Patients
- Hypertension: 0.900 (0.868-0.933)***
- Hyperlipidaemia: 0.836 (0.768-0.909)***
- Type 2 Diabetes: 0.860 (0.819-0.903)***
- Acute Coronary Syndrome: 0.863 (0.798-0.933)***

Widowed vs Single Patients
- Hypertension: 0.973 (0.960-0.987)***
- Hyperlipidaemia: 0.966 (0.933-1.000)
- Type 2 Diabetes: 0.965 (0.947-0.985)***
- Acute Coronary Syndrome: 0.959 (0.947-0.971)***

2) Increased mortality in divorced patients

Divorced vs Single Patients
- Hypertension: 0.981 (0.953-1.009)
- Hyperlipidaemia: 0.956 (0.897-1.019)
- Type 2 Diabetes: 0.943 (0.906-0.981)**
- Acute Coronary Syndrome: 1.068 (1.063-1.073)**

Divorced vs Married Patients
- Hypertension: 1.085 (1.034-1.139)***
- Hyperlipidaemia: 1.087 (0.978-1.210)
- Type 2 Diabetes: 1.041 (0.972-1.114)
- Acute Coronary Syndrome: 1.157 (1.041-1.287)*

1) Reduced mortality in married and widowed patients
2) Increased mortality in divorced patients
Conclusions

Marital status impacts mortality in patients with cardiovascular risk/disease

1) Married patients have significantly lower mortality rates:
   - Protective effect across all conditions
   - Ranges from 10% lower mortality in hypertension to 16% lower in hyperlipidaemia
   - Likely due to support in managing risk factors such as medication compliance, cardiac rehabilitation and living a healthier lifestyle
   - Marker of psychological support generally, and support in dealing with condition
2) Widowed patients have lower adjusted mortality rates
   – Likely benefit from similar protective support over a lifetime

3) Divorced patients with ACS and hypertension have higher mortality rates
   – Stressful life events/psychological illness are associated with CVD

Marital status is a marker of psychosocial health. This should be considered and replicated in all patients with cardiovascular disease.

Social support networks through friends, family or support groups could improve survival of patients with cardiovascular risk factors or disease.
Questions