Progression of Gestational Diabetes (GDM) to Type 2 Diabetes (T2DM) in Hawaii's Asian and Pacific Islander Populations

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Background

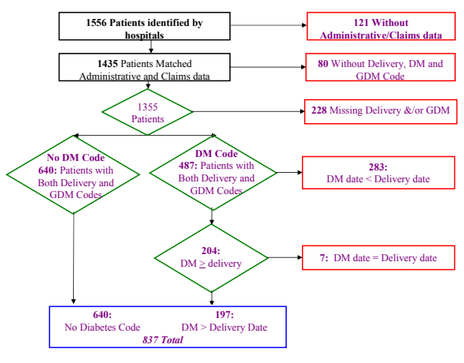
- GDM is a risk factor for the development of T2DM.
- Little is known about potential difference in the rates of progression from GDM to T2DM among minority populations.

Objective

- Assess the incidence of T2DM among Caucasian, Asian and Pacific Islander women with GDM in Hawaii..

Study Design

- Hospital discharge data and insurance claims data were used to longitudinally measure the incidence of T2DM from GDM.
- 1556 women with GDM were identified over a 5 year time period (1988-1993) from 2 primary delivery hospitals in Honolulu.
- 1435 cases were able to be matched with private and Medicaid insurance claims data. 598 cases were dropped from the sample for one or more of the following reasons:
  - Missing ICD-9 code for gestational diabetes.
  - Missing ICD-9 code for childbirth.
  - Type 2 diabetes diagnosis date before or on the day of childbirth.
- Final sample size 837 is comprised of 197 women who did progress from GDM to T2DM and 640 women who did not progress during the follow-up period of up to 9 years.



Analysis

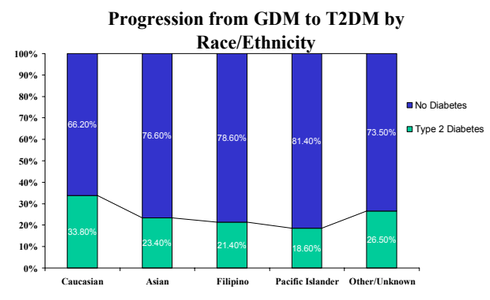
- Rate of progression to T2DM was determined both by incidence rates and Cox proportional hazard models.
- Incidence rates were calculated for each Race/Ethnicity group, as well as for the entire study population and sub-group of non-Caucasians.
- Cox proportional hazard model used Caucasians as the reference group and controlled for maternal age at childbirth.
  - Dependent variable is the time from childbirth until development of T2DM or last reported health system claim.

Sample Description

- Race/Ethnicity Breakdown
  - 48% Asian
  - 21.7% Filipino*
  - 12.2% Pacific Islander
  - 9.9% Other/Unknown
  - 8.1% Caucasian

  *Regarded as Asian by U.S. Census, but considered as separate group in this study.
- Age
  - 75.5% of women were between the ages of 30-39
  - 17.1% between the ages of 20-29
  - 7.4% between the ages of 40-49

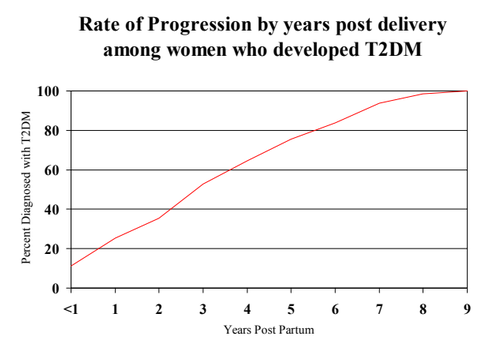
Results

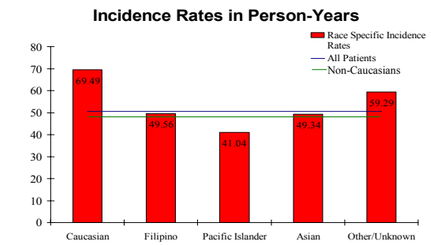


Results

- 23.54% progressed to Type 2 Diabetes during the follow-up period of up to 9 years.
- Caucasians were more likely to progress to T2DM than non-Caucasians
  - Odds Ratios
    - Asian 0.60
    - Filipino 0.53*
    - Pacific Islander 0.45*
    - Other/Unknown 0.70
    - All Non-Caucasian groups combined 0.57*

      *p<0.05
- Of those who progressed to T2DM, approximately 84% did so within 6 years post childbirth.
- Overall incidence rate for the study population was 50.47/1000 person-years
  - Pacific Islanders had the lowest incidence rate: 41.04/1000 person-years
  - Caucasians had the highest incidence rate: 69.49/1000 person-years





Models

- Cox proportional hazard model was used setting Caucasians as the comparative group and controlling for maternal age at childbirth.
  - Model 1: Each ethnic group was entered
    - Asians and Pacific Islanders were significantly lower with hazard ratios of 0.649 and 0.561, respectively (p=0.04, 0.05).
  - Model 2: Combined Asian and Pacific Islanders
    - Asian/PI group was significant with hazard ratio of 0.632 (p=0.03).
  - Model 3: Caucasian versus Non-Caucasian groups
    - Rate for non-Caucasians was significantly different from Caucasians with a hazard ratio of 0.647 (p=0.03).

Limitations

- Study relied on Administrative data only
- Differences in follow-up care may have influenced findings, but duration of follow-up was similar among groups
- Other risk factors such as BMI, parity, family history, etc. are unknown and may differ across groups.

Conclusion

- Minority populations in our study are less likely to develop T2DM after having GDM.
- Minority race/ethnicity was not a risk factor for progression from Gestational Diabetes to Type 2 Diabetes in our study.