Nasopharyngeal Cancer in Alaska Native People: A Cancer Health Disparity

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Nasopharyngeal Cancer in Alaska Native People

- Nasopharyngeal Cancer (NPC) is a cancer originating in the head and neck

- NPC is the leading cancer disparity among Alaska Native people
  - 17-fold higher incidence than in U.S. white population
  - Mortality rate 21 times higher than in U.S. whites
Age-Specific Incidence Rates of NPC in Alaska Native People

Specific Aims

• To create a statewide database of AN patients with NPC derived from:
  • Alaska Native Tumor Registry
  • Alaska Native Medical Center Tumor Registry
  • Electronic Patient Record Reviews

• To systematically describe patterns of care and clinical outcomes of AN NPC patients following radiation and chemotherapy regimens

• To determine whether baseline clinical and pathological features correlate with clinical responses to current NPC treatment regimens
NPC Alaska Native Patient Cohort

- Year Diagnosed: 1975-2015
- 180 Total patients
  - 123 Male (68%)
  - 57 Female (32%)
- Median Age of Diagnosis
  - Male: 59.5 years
  - Female: 60.9 years
Age at Time of Diagnosis

Chang ET, et al., Cancer Epidemiology, Biomarkers & Prevention. 2006, 15: 2356.
Tobacco Use among NPC Patients

- Missing: 50%
- Current user: 40%
- Former: 5%
- Non-smoker: 5%
NPC Stage at Diagnosis

NUMBER OF PATIENTS

- **UNKNOWN**: 49 male, 19 female
- **STAGE IV**: 55 male, 22 female
- **STAGE III**: 13 male, 3 female
- **STAGE II**: 4 male, 12 female
- **STAGE I**: 2 male, 1 female
WHO Classification of NPC

- **Type I:** keratinizing squamous cell carcinomas
- **Type II:** non-keratinizing squamous carcinomas
- **Type III:** undifferentiated carcinoma - high local control rate, higher incidence of distant metastasis
- Types II and III have a stronger relationship with Epstein-Barr virus
Type III NPC most common among AN Patients

TYPE I: KERATINIZING SQUAMOUS CELL CARCINOMA
- Male: 14
- Female: 28

TYPE II: NON-KERATINIZING DIFFERENTIATED CARCINOMA
- Male: 15
- Female: 12

TYPE III: UNDIFFERENTIATED CARCINOMA
- Male: 73
- Female: 28
Regional Distribution of Alaska Native NPC Cases

- Arctic Slope: < 6
- Northwest Arctic: 7
- Norton Sound: 25
- Yukon Kuskokwim: 28
- Interior: 15
- Copper River Area/Prince William Sound: < 6
- Southeast: 10
- Kodiak Island: < 6
- Southcentral: 42
- Bristol Bay: 11
- Aleutians/Pribilof Islands: < 6

Unknown = 33
Chemotherapy for NPC in Alaska Native People

Use of Chemotherapy During Each 10 Year Era
N=166

Number of Patients

- None
- Single Agent
- Multi-Agent

1975-1985: 40
1986-1995: 20
1996-2005: 30
2006-2015: 40
Radiation Therapy for NPC in Alaska Native People

Use of Radiation During Each 10 Year Era
N=180

Number of Patients

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Initial Responses to Therapy

• Data available since 2006
  • 46 patients
  • 1 declined treatment

• Induction chemotherapy with platinum and taxane-> chemo-RT

• 32/45 (71%) complete remission
NPC Relapse-Free Survival in Alaska Native Patients

NPC Relapse Outcome Kaplan-Meier Estimated Survival
N=83, 51 events

- Median NPC relapse-free survival 3.09 Years
  - 95% CI (2.36-6.02)
- 5 year NPC relapse-free survival 38.0%
  - 95% CI 28.2%-51.1%
NPC Specific Survival in Alaska Native Patients

NPC Death Outcome Kaplan-Meier Estimated Survival
N=170, 93 events

- Median NPC survival 3.19 Years
  - 95% CI (2.6-5.94)
- 5 year NPC survival 41.7%
  - 95% CI 34.1%-50.9%
Molecular Characterization of Nasopharyngeal Carcinoma in Alaska Native People

• Tissue collection protocol
• Assess cellular and molecular features of NPC in AN people and correlate them to clinical outcomes

• Specific objectives:
  • To characterize pathogenic EBV factors in NPC tumors and normal tissue specimens
  • To characterize the frequency of biologically relevant mutations in NPC tumors to gain insights into the pathogenesis of this disease
  • To identify NPC molecular markers that carry prognostic significance
  • To identify potential new targets for directed therapies for NPC in AN people

Dr. Anne Lanier
Conclusions

• NPC is the leading cancer disparity among Alaska Native (AN) people
• Male predominance, most patients are diagnosed at stage IV
• Current standard of care treatment of NPC involves combinations of chemotherapy and radiation
• Approximately 70% patients respond initially to treatment, but then relapse within five years
• Despite advances in chemotherapy and radiation techniques, two thirds of patients with NPC die from their disease
• Further research is needed to improve clinical outcomes
Collaborators

• Dr. Sarah Nash, ANTHC Epidemiology Center
• Dr. Holly Martinson, UAA-WWAMI program
• Erik Pihl, Mariah Minder, Julia Parrish, WWAMI Medical Students
• Dr. Peter Holck, UW
• Dr. Barb Stillwater, ANTHC Cancer program
• Linda O’Brien, ANTHC Tumor Registry
• Garrett Zimpelman, ANTHC Epidemiology Center

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Thank you!