THE ALASKA HEPATITIS STORY: HOW RESEARCH HELPED REDUCE THE THREAT OF VIRAL HEPATITIS

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Goals of This Talk

- Describing collaborative research between Communities, Tribal Organizations and Investigators
  - The Alaska hepatitis B story
  - The Alaska hepatitis A story
Recognition of a Disease Problem/Disparity

Study Epidemiology and How Disease is Spread

Study a Possible Intervention: Vaccine or Drug

Implement Program to Control Disease and Reduce Disparity

Evaluate Impact and Success of Program
1972-1974: My 1\textsuperscript{st} years in the YK Delta
How I Fell in Love with Alaska
How I Came to Enjoy Working with and Knowing Alaska Native Communities and the People: Lower Yukon Villages
My time in Barrow:
Summer 1974
Wow! Is this Fun
Hepatitis B Virus (HBV): What is It?

- Hepatitis B is a virus spread by contaminated blood and other body fluids
- It is very infectious and survives on environmental surfaces for long periods
- Causes yellow jaundice (nausea, vomiting, yellow eyes and skin)
- Can become chronic, especially if children are infected and lead to liver cancer and liver scarring (cirrhosis) later in life
The Ugly Face of Hepatitis B Virus
1970: Jaundice in YK Delta: Liver Cancer in children

Virus spread rapidly in children; found all over environmental surfaces

1980: Hepatitis B vaccine becomes available for a trial

YKHC and NSHC approve vaccine trial

Vaccine >95% protective: No serious side effects
1983: Results presented to YKHC Board: They want more done

$½ million proposal drawn up; sent to IHS Director

YKHC and TCC go to ADN: Headlines: New vaccine tested in Alaska prevents hepatitis B and cancer but “Nothing being done”

Ted Stevens storms into IHS Directors office: Given proposal; $½ million passes Congress in 1 week

1984: Frank Murkowski holds Senate Hearing: “Why aren’t you vaccinating the entire Alaska Native Population?” Answer: no money. $9 million obtained one month later
Implement Program

- Program contracted to Alaska Native Corporations and State
- 52,000 Alaska Natives persons tested for HBV (75% of population)
- 40,000 Vaccinated: 90% in Areas with highest risk (prevalence)
Evaluate Impact

Hepatitis B rate from highest in US to Lowest in World in < 1 decade

Liver cancer and chronic hepatitis B disappears in children

Reduction in Death in adults from liver cancer

Studies demonstrate protection lasts for decades: Dr. Mike Bruce and Dr. Brenna Simons to present Data in upcoming sessions

Rate per 100,000

Year


Southwest Alaska

Statewide

100
80
60
40
20
0

Vaccine Demonstration Program

Statewide Immunization Program
Number of Alaska Native Children Under 20 Years of Age who Tested Positive for Hepatitis B: 1988-2008

Figure 2.
Hepatocellular Cancer in Alaska Native Children <20 Years Old, 1969-2008
What about those Alaska Native Persons who Got Chronic HBV before Vaccine?

1560 AN Persons Identified with Chronic Hepatitis B: 15-25% Could Die Prematurely from Liver Cancer or Cirrhosis

Using Banked Sera: AFP elevated 2-3 years earlier in HCC

1980: Report of Using AFP to Find Liver Cancer Early with Surgical Cures

Pilot Study: Small Suspicious area on CT Identified in Young Adolescent; “Open Me Up, I Don’t Want to Die of Liver Cancer”

Since 1983, AFP Testing on all Hepatitis B Infected Persons

1 inch tumor
The Success of the Hepatitis B Liver Cancer Screening Program

• Since 1982, 75% of cancers found early enough to remove surgically or burn out with radiofrequency ablation
• Overall survival went from 0 alive at 1 year before program to 40% cancer free at 5-years after diagnosis

• Wait a minute!
• What about Cirrhosis from liver scarring?
• Can we prevent it?
“A Pregnant Man Delivers in his Grave”
African Men with Terminal Liver Failure
Hepatitis B Liver Failure in Alaska

- 1996 young AN male with HBV from village, comes to ANMC ER with ascites and jaundiced
- New oral drug, lamivudine, just licensed for HIV also with activity against hepatitis B
- Given to this patient
- 2 weeks later, jaundice and ascites gone
- 1 month later: all liver function tests normal
- Patient now in mid 30’s, still on same medication and doing well
Preventing Cirrhosis in Hepatitis B

• What is needed to find those who were getting liver scarring early?
  • Ability to do liver function tests (LFT) and measure level of virus in blood (HBV DNA)
  • Put appropriate patients on antiviral drug to prevent liver failure

• 2001: Established 1st medical molecular biology in Alaska laboratory at ANMC with help from UAA
  • Began testing for LFT and HBV DNA to identify persons who need antiviral treatment
  • 5 different genotypes of HBV found: genotypes F and C worst
  • Over 100 persons now on long-term antiviral therapy
Hepatitis A

- Hepatitis A virus (HAV) is a virus transmitted from person to person.
- HAV survives in water, food on unwashed hands and environmental surfaces and resists freezing.
- Rural Alaska experienced severe outbreaks of HAV every 7-10 years.
- Alaska had by far the highest rate of hepatitis A in the US.
Hepatitis A in Alaska Native People, 1972-2011
The HAV Control Project

- Epidemiology: using banked sera, most adults previously infected but children susceptible
- Hepatitis A vaccine study at ANMC in children and Adults prior licensure: vaccine 100% effective
- 1993: outbreak in AN villages. Vaccine study to try to halt the epidemic of hepatitis A
Other Studies on Viral Hepatitis and Liver Disease You Will Hear About in Upcoming Sessions

- **Hepatitis C:**
  - Now #1 cause of liver cancer in Alaska Native People
  - #1 reason for liver transplant in the US
  - Can now be cured

- **Autoimmune Liver Disease:** Alaska Native Women have highest rates in the world

- **AFP Cost effectiveness**

- **Laboratory research projects on protection from hepatitis B vaccination and chronic hepatitis B**

- **Hepatitis A long-term effectiveness**
Research in Hepatitis Benefits US and other Countries

• ANTHC
  • 1st place to use infant and child hepatitis B vaccination
    • Now World Health Organization policy
  • 1st place to use child hepatitis A vaccine:

• ANTHC and AIP CDC work with Arctic Countries
  • To introduce infant and child hepatitis B vaccine in Greenland and Canada

• ANTHC
  • Working with Greenland to develop program to care for persons with chronic HBV living in remote communities
People and Communities

Where do the best ideas for research come from?

- Communities and Alaska Native People
- Researchers or Health Care workers in Alaska
- Outside Research Institutions
  - Best when institute works closely with AN Health Corporations and Communities
  - Worst when they want study an idea they came up with alone
Collaboration Between Community, Patients and Providers and Investigators:
Alaska Native and other Organizations Cooperate in Research

- People and Communities
- ANTHC and Tribal Health Corporations
- Tribal Health Care System
- Health Records Databases and Registries
- Serum and Tissue Bank
- Research Infrastructure
  - ANTHC, SCF and Tribal Research Departments and Programs
  - CDC Arctic Investigations Program
  - ANTHC Epidemiology Center
  - Academic and Community Partners
  - University of Alaska Anchorage and Fairbanks
  - Other Academic Institutions especially University of Washington WWAMI
  - State of Alaska
  - Other Alaska Hospitals
Thank You