

New-onset Diabetes is a Marker of Pancreatic Cancer

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E-mail from a worried wife....

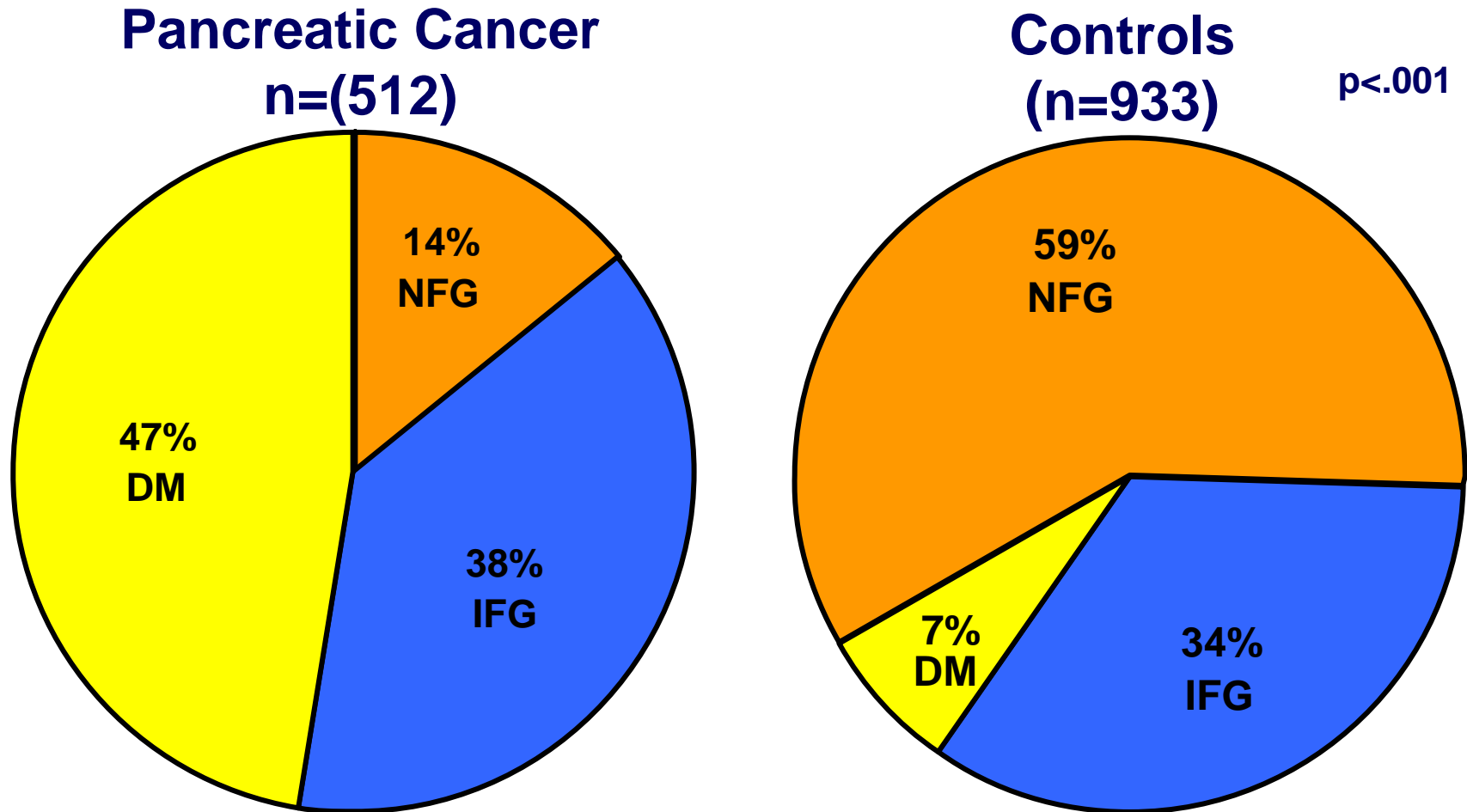
- “... my 65 y.o. husband was recently diagnosed with diabetes with a fasting sugar of 255 mg/dl. He is not obese. He does not have a family history of diabetes. He has also lost 15 lbs.....
- I am worried. I think this man needs to have an EUS to rule out pancreatic cancer.
- I have spoken repeatedly to his GP and Internist and I have been told testing would not be beneficial as pancreatic cancer is so aggressive and always fatal.
- Also they both point out that he has no symptoms of pancreatic cancer so have thus far refused to schedule any tests”

New-onset diabetes as a marker of early pancreatic cancer

- What is the prevalence of DM in PaC?
- What proportion of new-onset DM will have PaC?
- Does DM occur early enough in the course of PaC to be clinically useful?
- Are we ready to screen new-onset diabetes for PaC?

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- Prevalence of DM in PaC
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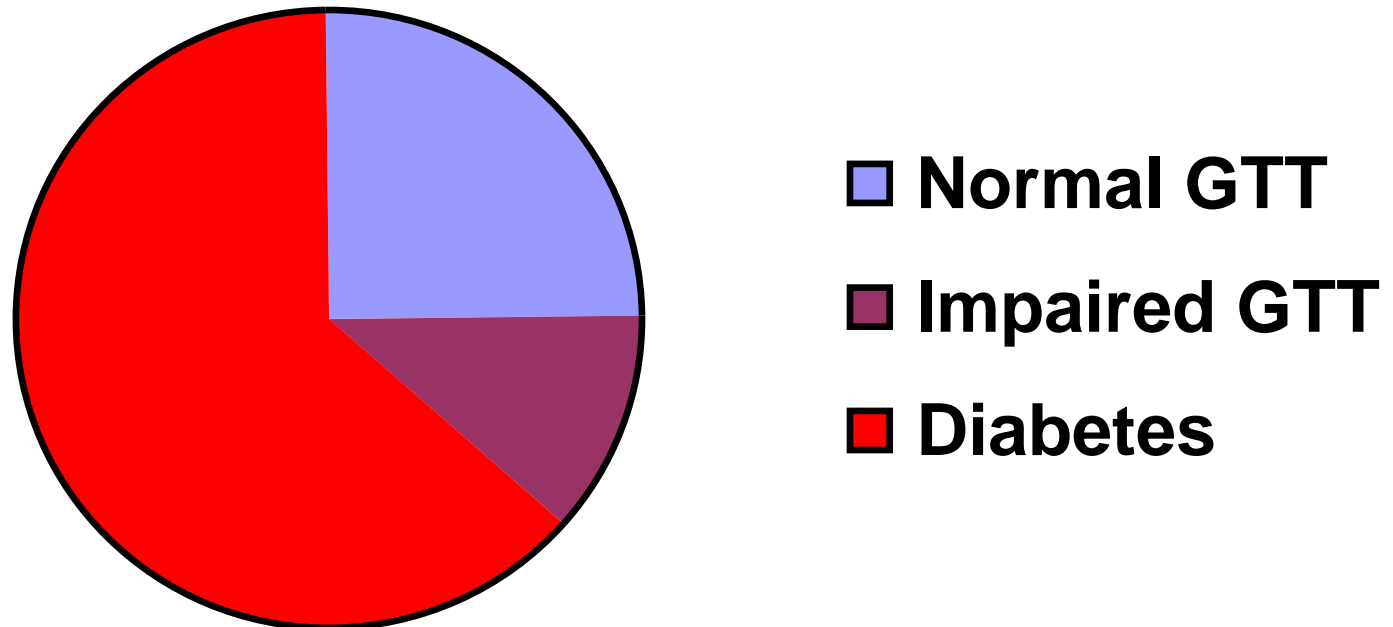
Prevalence of DM in PaC vs. Controls



Pannala et al Gastroenterology 2008;134:981-7

Prevalence of DM in PaC (n=44)

Results based on oral Glucose Tolerance Test (GTT)



Permert et al, Eur J Surg 1993;159:101-7

Prevalence of DM in PaC

- When PaC patients are screened for DM the prevalence of DM is extremely high (45%-65%)
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Prevalence of Pancreatic Cancer in Subjects with New-onset Diabetes

Studies Screening New-onset DM for Pancreatic Cancer

- Prevalence of pancreatic cancer in diabetes subjects screened for cancer
 - 5.2%
 - Damiano J et al Should pancreas imaging be recommended in patients over 50 years when diabetes is discovered because of acute symptoms? Diabetes Metab 30:203-207, 2004
 - 13.6%
 - Ogawa Yet al: A prospective pancreatographic study of the prevalence of pancreatic carcinoma in patients with diabetes mellitus. Cancer 94:2344-2349, 2002

Probability of Pancreatic Cancer Following Diabetes: A Population-based Study

- To estimate probability of PaC within 3 years of first meeting criteria for diabetes in subjects ≥ 50 years of age.
- Setting: The Rochester Epidemiology Project diabetes incidence cohort
 - Chari,ST et al. *Gastroenterology* 2005;129:504-11.

Results

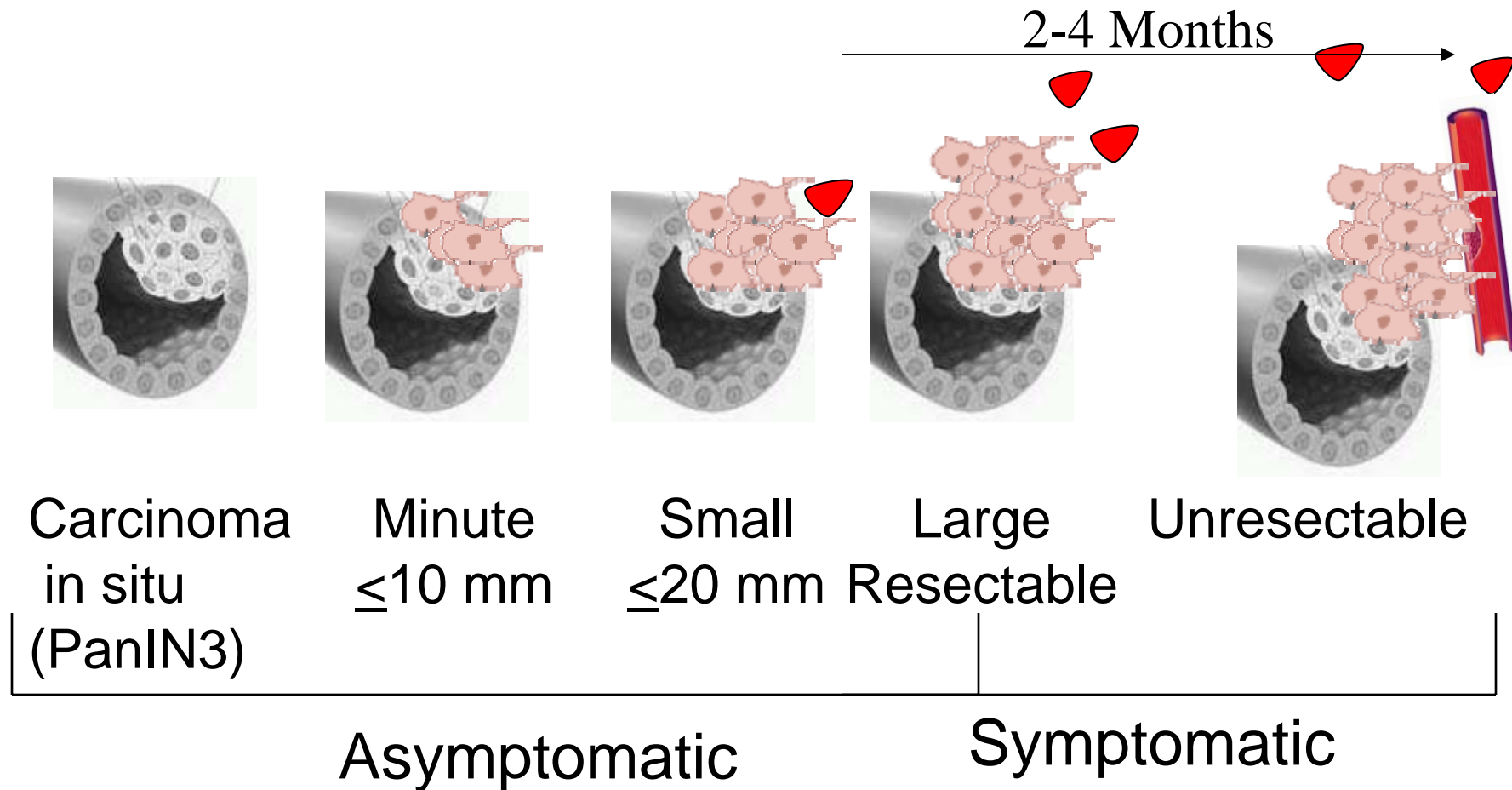
- 2,122 subjects ≥ 50 yr of age first met criteria for DM during study period
- Follow-up: for 3 yrs after meeting DM criteria
- 5,799 diabetes person-years of fu
- 18 (0.85%) diagnosed with PaC within 3 years of first meeting criteria for DM
- Overall risk ~ 8 times compared to age matched general population

Conclusions

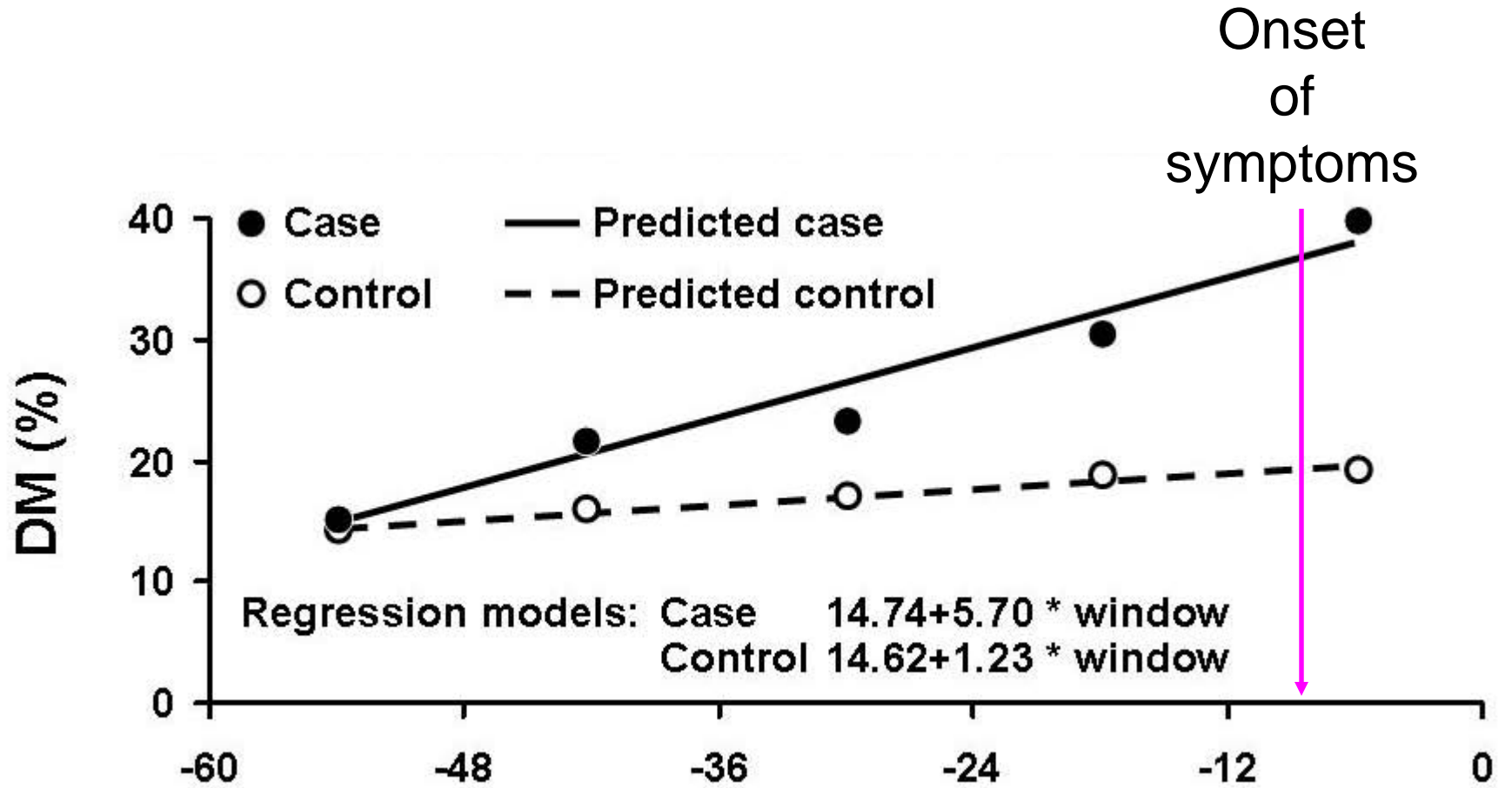
- Compared to the general population persons aged 50 and over are **~8 times** more likely to be diagnosed with PaC in the 3 years following diagnosis of diabetes
- 1 in 125 subjects were diagnosed with PaC within 3 years of meeting biochemical criteria for DM
- The probability is particularly increased among those ≥ 70 years of age

Does diabetes occur early enough to be clinically useful in pancreatic cancer?

Usual Progression of Pancreatic Cancer



Onset of DM Occurs when PaC is Asymptomatic



Proposed Strategy for Screening for Undiagnosed Pancreatic Cancer using Hyperglycemia as Indicator

Newly diagnosed diabetes > 50 years of age

Are we there yet?

Screen for PaC using imaging techniques, e.g., endoscopic ultrasound



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Proposed Strategy for Screening for Undiagnosed Pancreatic Cancer using Hyperglycemia as Indicator

FBG during routine Physical Examination



Elevated FBG



Identify a unique biomarker for PaCDM



Suggestive of PaCDM



**Screen for PaC using imaging techniques,
e.g., endoscopic ultrasound**

Summary

- Recognition of new-onset DM as an early manifestation of PaC could lead to diagnosis of asymptomatic early stage PaC.
- The success of the strategy to use hyperglycemia as a screening tool to identify subjects with a high likelihood of having asymptomatic PaC will depend largely on our ability to differentiate PaCDM from the more common type 2 DM.