Successful Pancreatic Cancer Screening Among Individuals at Elevated Risk Using Endoscopic Ultrasound and Magnetic Resonance Imaging

A Community Hospital Experience

SUPPLEMENTAL DIGITAL CONTENT

Supplemental Digital Content 1

Eligibility Criteria and Age at Initiation of Testing
Subjects met the criteria for any one of the following seven risk groups. Age at initiation of testing is listed in parenthesis or ten years younger than the earliest age of pancreatic cancer in the family (whichever is earliest).

Deleterious Germline Mutation Carrier (40). Must Have Either of the Two:
a. *BRCA2* (Hereditary Breast and Ovarian Cancer (HBOC)
b. *CDKN2A* (Familial atypical multiple mole melanoma (FAMMM))

Deleterious Germline Mutation Carrier of Any of the Six, Plus With at Least One First-Degree Relative (FDR) or Second-Degree Relative (SDR) With Pancreatic Cancer (40) :
a. *BRCA1* (HBOC)
b. *MLH1, MSH2, PMS2, MSH6*, (hereditary non-polyposis colorectal cancer (HNPCC))
c.. *P53* (Li Fraumeni)
d. *PALB2* (HPC)
e. *APC* (FAP)
f. *ATM* (Ataxia-Telangiectasia)

Peutz-Jeghers Syndrome (30). Must Have All of the Following:
1. 30-80 years old
2. Known *STK11* gene carrier
3. At least two of three PJS criteria
i. characteristic intestinal hamartomatous polyps
ii. mucocutaneous melanin deposition
iii. family history of Peutz-Jeghers Syndrome

Familial Pancreatic Cancer (40). Must Have All of the Following:
1. Two affected relatives who are FDR to each other
2. One of those affected must be FDR to the subject

Both Parents Affected, Any Age (50).

Young Onset Family (At least 10 years younger than affected FDR)
-Have a FDR who was diagnosed with pancreatic cancer under the age of 50

Hereditary Pancreatitis Syndrome (40). Must Have Presence of Either Gene *PRSS1* (Autosomal Dominant) or *SPINK1* (Autosomal Recessive) Plus Any of the Following:
a. Unexplained documented episode of pancreatitis as a child
b. Idiopathic chronic pancreatitis, particularly when the onset of pancreatitis occurs before age 25
c. Family history of recurrent acute pancreatitis, idiopathic chronic pancreatitis, or childhood pancreatitis without known cause
d. Recurrent acute attacks of pancreatitis for which there is no identifiable cause

Supplemental Digital Content 2

Description of EUS Procedure

An Olympus (Center Valley, Pa) radial array echoendoscope (GF-UE160-AL5) was used at the start of most of the procedures. If this was not possible, or if sufficient visualization was not possible with the radial instrument or FNA (fine needle aspiration) became necessary, the Olympus Linear Array Echoendoscope (GIF-UCT 180) was then inserted to complete the examination. An ALOKA ARIETTA 850 ultrasound processor was used for each procedure. All images were reviewed by an endosonographer with more than 20 years of experience.

SUPPLEMENTAL TABLE 1. 25 Cohort Studies Cited by the 2020 International Pancreatic Cancer Screening Consortium*

Author, Year	Lead Author Hospital Affiliation	n	EUS, MRI, Both	Serial Testing
Kimmey et al, 2002[1]	University of Washington, Seattle	46	E	Y
Canto et al, 2004[2]	Johns Hopkins Medical Institution	38	E	N
Canto et al, 2004[3]	Johns Hopkins Medical Institution	78	E	N
Langer et al, 2009[4]	Philipps-University Marburg	76	B	Y
Poley et al, 2009[5]	University Medical Center, Rotterdam	44	E	N
Verna et al, 2010[6]	Columbia University College of Physicians and Surgeons	51	B	N
Ludwig et al, 2011[7]	Memorial Sloan Kettering Cancer Center	309	B	N
Vasen et al, 2011[8]	University Medical Center, Leiden	79	M	Y
Canto et al, 2012[9]	Johns Hopkins Medical Institutions	212	B	N
Al-Sukhni et al, 2012[10]	University of Toronto	262	M	Y
Potjer et al, 2013[11]	University Medical Center, Leiden	241	B	Y
Sud et al, 2014[12]	Aurora St Luke's Medical Center, Milwaukee	30	E	N
Del Ciaro et al, 2015[13]	Karolisnka Institute, Stockholm	40	M	N
Mocci et al, 2015[14]	Ramon y Cajal University Hospital	38	B	Y
Bartsch et al, 2016[15]	Philipps University Marburg	253	B	Y
Vasen et al, 2016[16]	Leiden University Medical Center	411	B	Y
Joergensen et al, 2016[17]	Odense University Hospital	71	E	Y
Chang et al, 2017[18]	National Taiwan University Hospital	303	M	N
Barnes et al, 2017[19]	The Medical College of Wisconsin	75	B	Y
DaVee et al, 2018[20]	The University of Texas MD Anderson Cancer Center	86	B	Y
Canto et al, 2018[21]	Johns Hopkins Medical Institutions	354	B	Y
Gangi et al, 2018[22]	Moffit Cancer Center	58	E	Y
Lachter et al, 2018[23]	Rambam Health Care Campus	123	E	Y
Paiella et al, 2019[24]	University of Verona	187	B	N
Sheel et al, 2019[25]	University of Liverpool	321	B	Y

Adapted from Goggins et al, 2020.[26]

E indicates endoscopic ultrasound (EUS); M, magnetic resonance imaging (MRI); B, both; N, no; Y, yes.

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