Prevalence and Characteristics of Therapy-Associated Polyposis: A Systematic Review

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PURPOSE/OBJECTIVES

- Therapy-associated Polyposis (TAP) is a poorly understood condition in which colorectal polyps develop in individuals with childhood and young adulthood cancers (CYAC) who were treated with chemotherapy and/or radiation, in the absence of a genetic predisposition to polyposis syndromes
- We aimed to determine characteristics of these individuals and the polyposis to better understand TAP

METHODS AND MATERIALS

- This systematic review was in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Statement (PRISMA)
- PubMed and Embase were searched from when TAP was first reported in January 2014 to April 2022
- Inclusion criteria: citations of cases with CYAC (diagnosed at <39 years) treated with chemotherapy and/or radiation with >10 lifetime polyps and negative genetic testing for hereditary polyposis syndromes
- For individuals' characteristics we represented continuous measurements as medians (IQRs) and compared them using the Mann-Whitney- Wilcoxon test
- For categorical data Pearson's Chi-square test was used

RESULTS

- 3766 publications were screened, 6 met inclusion criteria for 44 individuals total (Figure 1)
- Cases were divided into 2 groups: those aged < 18 years at diagnosis of their primary cancer versus young adults (18-39 years)
- The most common primary cancer was Hodgkin's lymphoma in both groups; most cases were treated with both chemotherapy and radiation (Table 1)

	Total	Age at Cancer Diagnosis		p-value
		< 18 Years	≥18 Years	
	N=44	N=24	N=20	
Median Age at Cancer Diagnosis (yrs)	16.0 (10.0-22.5)	11.5 (4.25-15.0)	23.0 (21.0-30.0)	< 0.001
Sex (n)				0.28
Female	17 (39%)	11 (46%)	6 (30%	
Male	27 (61%)	13 (54%)	14 (70%)	
Type of Cancer (n)				0.12
Acute myeloid leukemia	1 (2%)	1 (4%)	0 (0%)	
Hodgkin's Lymphoma	33 (76%)	15 (63%)	18 (90%)	
Medulloblastoma	1 (2%)	1 (4%)	0 (0%)	
Nephroblastoma	2 (5%)	2 (8%)	0 (0%)	
Non-Hodgkin's lymphoma	1 (2%)	0 (0%)	1 (5%)	
Teratoma of R testis	1 (2%)	0 (0%)	1 (5%)	
Radiation Above Diaphragm (n)	32 (73%)	17 (71%)	15 (75%)	0.95
Radiation Below Diaphragm (n)	29 (66%)	16 (67%)	14 (70%)	
Alkylating Agents (n)	29 (66%)	17 (71%)	12 (60%)	0.56
Median Age at First Polyps (yrs)	46.5 (34.5-52.5)	43.0 (29.0-50.0)	50.5 (43.5-55.0)	0.005
Time from Cancer Diagnosis to First Polyp (years)	26.7 (22.5-33.0)	29.3 (24.6-35.5)	26.0 (19.5-28.0)	0.033
Number of Polyps (n)				
Total	30.5 (18.5-50.0)	21.5 (16.0-31.5)	40.0 (32.0-59.0)	0.001
Adenoma	9.5 (2.0-21.0)	9.5 (2.0-21.0)	10.5 (1.5-20.5)	0.93
Sessile Serrated	2.0 (0.0-18.0)	1.5 (0.0-5.5)	2.0 (0.0-32.5)	0.38
Hyperplastic	2.0 (0.0-5.0)	1.5 (0.0-3.0)	4.0 (0.0-9.5)	0.10
Colorectal Cancer (n)	13 (30%)	5 (21%)	8 (40%)	0.17
Other Neoplasms (n)	23 (52%)	11 (46%)	12 (60%)	0.35

Table 1. Baseline characteristics of individuals with Therapy-associated Polyposis based on age at diagnosis of primary cancer

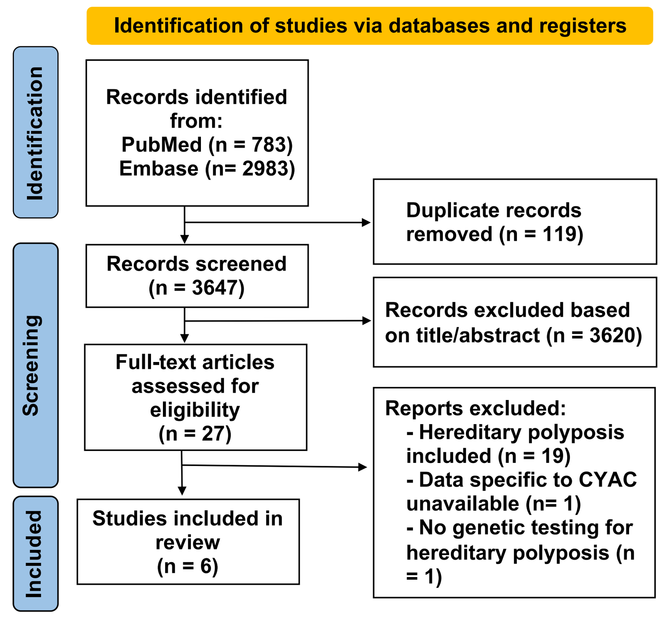

Figure 1. Flow diagram of search results and citation screening for Therapy-associated Polyposis

Results (cont.)

- Individuals with CYAC diagnosed as young adults developed more polyps than with CYAC as children (40.0 vs. 21.5, p=0.001), with no difference between polyp types. Most were adenomas.
- Children with CYAC were diagnosed with TAP earlier than young adults (43.0 vs. 50.5 years, p= 0.005)
- Young adults had a shorter interval between primary cancer diagnosis and polyposis (26.0 vs 29.3 years, p=0.03)
- **Notably, 30% of cases with TAP developed colorectal cancer (CRC), with no significant difference in the proportion developing CRC between the groups**

DISCUSSION

- Current guidelines recommend that individuals who undergo abdominal, pelvic, spinal, or total body irradiation begin CRC screening 5 years after radiation or at age 30 (whichever is later)
- Individuals diagnosed with cancer as children developed TAP earlier than young adults
- Individuals treated as young adults developed more polyps
- There is a high incidence of CRC in TAP
- Further investigation is necessary to determine the prevalence of TAP after CYAC and the role of early CRC screening for patients treated for CYAC

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