

# Metabolic laboratory abnormalities in patients with confluent and reticulated papillomatosis: A retrospective chart review

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# Background

- Confluent and reticulated papillomatosis (CARP) presents with hyperpigmented macules and papules in a net-like distribution<sup>1</sup>
- CARP is associated with endocrinopathies, obesity, and acanthosis nigricans (AN)<sup>2</sup>

# Objectives

- To further characterize comorbidities and laboratory abnormalities in patients with CARP

# Methods

- Retrospective chart review of clinically diagnosed CARP patients at Atrium Health Wake Forest Baptist Dermatology, Jan/2000-May/2023
- Charts identified using ICD9 (701.2) and ICD10 (L83) codes
- Demographics, medical history, and laboratory values within one year before diagnosis and thereafter were collected

# Statistical Analysis

- $\chi^2$  and 2-tailed  $t$ -tests compared categorical and continuous variables, respectively ( $P < 0.05$ )



1. Davis MD, Weenig RH, et al. Confluent and reticulate papillomatosis (Gougerot-Carteaud syndrome): a minocycline-responsive dermatosis without evidence for yeast in pathogenesis. A study of 39 patients and a proposal of diagnostic criteria. *Br J Dermatol.* 2006;154(2):287-293.

2. Xiao TL, Duan GY, Stein SL. Retrospective review of confluent and reticulated papillomatosis in pediatric patients. *Pediatr Dermatol.* 2021;38(5):1202-1209.

# Results

**Table 1.** Patient demographics and comorbidities

- Of 1541 records, 143 patients were included
- Mean age 27 years; 54% were women and 65% were Black
- Mean body mass index (BMI) was 32 (standard deviation: 9)
- 48% of patients had concomitant AN

n=143		
Characteristic	Average $\pm$ SD (Range)	No. of patients (%)
Age, y	27 $\pm$ 10 (12-72)	
Biopsy-confirmed CARP		10 (7)
<b>Sex</b>		
Female		77 (53.8)
Male		66 (46.2)
<b>Race</b>		
Black		93 (65)
White or Caucasian		23 (16.1)
Other		20 (14)
Asian		7 (4.9)
<b>Ethnicity</b>		
Not Hispanic, Latino, or Spanish		127 (88.9)
Hispanic, Latino, or Spanish		15 (10.5)
Undocumented		1 (0.7)
<b>BMI</b>	32 $\pm$ 9 (14.6-57.1)	
<b>Comorbidities</b>		
Acanthosis nigricans		69 (48.3)
Hyperlipidemia		20 (14)
Hypertension		27 (18.9)
Polycystic ovary syndrome (n=77)		9 (6.3)
Type 2 diabetes mellitus		13 (9.1)
Type 1 diabetes mellitus		0
Cushing syndrome		0
Thyroid disease		8 (5.6)
Autoimmune disease		3 (2.1)
<b>Family history</b>		
Diabetes		60 (42)
Hypertension		50 (35)
Hyperlipidemia		23 (16.1)

# Results (*cont'd*)

**Table 2.** Laboratory values in patients with CARP

	<b>Pediatric patients (n=36)</b>	<b>Adult patients (n=107)</b>	<b>All patients (n=143)</b>
<b>Category</b>	<b>Mean ± SD (Range)</b>	<b>Mean ± SD (Range)</b>	<b>Mean ± SD (Range)</b>
Random glucose	90.8 ± 22.3 (72-144)	97.5 ± 34.5 (23-338)	97.6 ± 33.1 (23-338)
Fasting glucose	21.9 ± 15.2 (8.2-45)	187.5 ± 158.7 (94-425)	187.5 ± 158.7 (94-425)
Serum insulin		56.1 ± 29.2 (14.2-16.2)	41.9 ± 29.3 (8.2-91)
HbA1c	5.5 ± 0.2 (5-5.9)	6.2 ± 2.4 (4.5-16.2)	6 ± 2.2 (4.5-16.2)
Total cholesterol	157.5 ± 27.2 (116-210)	163.3 ± 36.2 (84-266)	162.2 ± 34.6 (84-266)
LDL cholesterol	97.7 ± 25.7 (50-149)	104.8 ± 34.9 (23-183)	103.6 ± 33.4 (23-183)

# Results (*cont'd*)

**Table 2 (*cont'd*).** Laboratory values in patients with CARP

- 24% and 18% of patients had high low-density lipoprotein (LDL) and total cholesterol levels, respectively
- 33% had elevated hemoglobin A1c (HbA1c)
- 27%, 20%, and 40% of adults had elevated total and LDL cholesterol, and HbA1c, respectively
- CARP patients with versus without AN were older (67% [ $\geq 18$  years]) vs. 33% [ $< 18$ ],  $P=0.03$ ), had higher average BMI (36 vs. 28,  $P<0.001$ ) and LDL cholesterol (110 vs. 92 mg/dL,  $P=0.03$ ).

	Pediatric patients	Adult patients	All patients	
Category	No. of patients (%) (n=36)	No. of patients (%) (n=107)	No. of patients (%) (n=143)	Reference
<b>Serum insulin</b>				
Normal	10 (27.8)	66 (61.7)	6 (4.2)	<25 mU/L
High	0	1 (0.9)	6 (4.2)	$\geq 25$ mU/L
Unmeasured	26 (72.2)	40 (37.4)	131 (91.6)	
<b>Random glucose</b>				
Normal	10 (27.8)	66 (61.7)	76 (53.1)	<200 mg/dL
Diabetes	0	1 (0.9)	1 (0.7)	$\geq 200$ mg/dL
Unmeasured	26 (72.2)	40 (37.4)	66 (46.2)	
<b>Fasting glucose</b>				
Normal	0	1 (0.9)	1 (0.7)	<100 mg/dL
Borderline	0	2 (1.9)	2 (1.4)	100-125 mg/dL
High	0	1 (0.9)	1 (0.7)	$\geq 126$ mg/dL
Unmeasured	36 (100)	103 (96.3)	139 (97.2)	
<b>Hemoglobin A1c</b>				
Normal	10 (27.8)	26 (24.3)	36 (25.2)	<5.7%
Pre-diabetes	1 (2.8)	11 (10.3)	12 (8.4)	5.7%-6.4%
Diabetes	0	6 (5.6)	6 (4.2)	$\geq 6.5\%$
Unmeasured	25 (69.4)	64 (59.8)	89 (62.2)	
<b>Total cholesterol</b>				
Normal	5 (13.9)	28 (26.2)	33 (23.1)	<170 mg/dL
Borderline	4 (11.1)	10 (9.3)	14 (9.8)	170-199 mg/dL
High	1 (2.8)	9 (8.4)	10 (7)	$\geq 200$ mg/dL
Unmeasured	26 (72.2)	60 (56.1)	86 (60.1)	
<b>LDL cholesterol</b>				
Normal	9 (25)	59 (26.2)	37 (25.9)	<110 mg/dL
Borderline	0	7 (6.5)	7 (4.9)	110-129 mg/dL
High	1 (2.8)	13 (12.2)	14 (9.8)	$\geq 130$ mg/dL
Unmeasured	26 (72.2)	59 (55.1)	85 (59.4)	

# Discussion/Conclusions

- Elevated HbA1c (40%) and LDL cholesterol (27%) are prevalent in adults with CARP
- In contrast, 15% and 18% of pediatric patients had high HbA1c and LDL cholesterol, respectively, in Mackenzie et al's retrospective study (n=111)<sup>3</sup>
- Average BMI and LDL cholesterol were significantly higher in CARP patients with vs. without AN
- Adults with CARP and CARP patients with AN may be at increased risk for cardiometabolic conditions such as type 2 diabetes mellitus and coronary artery disease
- Measuring serum insulin and lipid profile may be considered at CARP diagnosis in these patients

**Limitations:** retrospective and single-center design, lack of a control group, limited laboratory data spanning a broad timeframe from CARP diagnosis, and not requiring histological CARP confirmation.

3. McKenzie PL, Ogwumike E, Agim NG. Confluent and reticulated papillomatosis in pediatric patients at an urban tertiary care center. *Pediatr Dermatol*. 2022;39(4):574-577. doi:10.1111/pde.15023