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RESEARCH ARTICLE

SOCIO-ECONOMIC AND BEHAVIORAL RISK-FACTORS OF CERVICAL LESIONS IN ADJARA REGION (REPUBLIC OF GEORGIA).

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Abstract

The aim of our investigation was the study of socio-economic, demographic and behavioral risk-factors in the development of cervical lesions in Adjara region (Georgia).

Material and Methods:775 women have been investigated (age 25-60 years) by – gynecological examination, PAP-test, colposcopy, cytomorphology. Patients were divided by two groups according geographical location: Group 1 – Rural Mountain Adjara (n=194; mean age - 41.58 ± 9.03 years); Group 2 – Urban Seaside Adjara (n=581; mean age - 40.10±8.85 years). Specific questionnaires have been used to evaluate nutritional and behavioral characteristics.

Results: Cervical lesions have been identified in 89 cases. The distribution of these cases showed that the patients with cervical lesions in Group 1 (14.43%) was significantly higher than in the seaside women (9.29%; p=0.043). Married women were significantly more in group 1 compared to group 2 (p<0.001); the percentage of women with low family income in group 1 was significantly higher than in group 2 (p<0.001). The results of the assessment of risk-factors showed that marital status was not significant; family income was not significant too. Breakfast skipping was significant risk-factor for cervical lessions (RR=2.67; p<0.001); sleep continuity (RR=1.61; p=0.041); chronic insomnia (RR=9.24; p<0.001); drowsiness (RR=34.68; p<0.001) were also significant.

Conclusions: Rural Adjara habitants have significantly high prevalence of cervical lesions compared to urban habitants. Family income was main socio-economic risk-factor for the development of cervical lesions in Adjara region. Food and meal intake habits, sleep disorders were associated with cervical lesions in whole region.

Introduction:-

The cervical cancer was diagnosed in 526,000 cases and 239,000 has been died; The odds of cancer development is most higher in countries with lower socio-demographic indices (one case in every 24 women; Siegel et al., 2019). The 2016 data of Georgian National Center of Disease Control showed that the share of cervical cancers of 1st and

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2nd stages in the incidence is only 55.3%, which was explained by low values of screening coverage: Tbilisi (capital of Georgia) – 18% and other regions – 11.5% (Georgian NCDC, 2016).

HPV infection and sexually transmitted diseases, oral contraception and intrauterine devices, obesity, immune system reduced functioning, many deliveries, age at first delivery, smoking and nutrition have been reported among the main reasons of cervical intraepithelial neoplasia (CIN) (Georgian NCDC, 2016; Si et al., 2017; Brennan et al., 2010).

There are a few information of the relationship of diet and nutritional pattern with HPV infection and cervical intraepithelial lesions compared to socio-economic and demographic data [5,6]. Sedjo et al. showed that lutein and lycopene may reduce the incidence of cervical cancer due to their antioxidant properties (Sedjo et al., 2002). Moreover, Barchitta et al. (2018) studied the relationship between nutritional pattern and HPV infection and concluded that women with "Mediterranean diet" (high content of fruit and vegetables) are characterized by lower risk of HPV infections of oncogenic types. It was also lower the risk of CIN development in these women compared to women with the "western diet" nutritional pattern (fast food).

Therefore, the aim of our investigation was the study of socio-economic, demographic and behavioral risk-factors in the development of cervical lesions in specific Region of the Republic of Georgia, Adjara, which is characterized by variety of food and meal intake habits, geographical locations [from urban (seaside) to rural (mountains) – about 2,000 m above sea level) in comparable small area), the distance to healthcare units, etc.

Material and Methods:-

775 women of Adjara region have been investigated (age 25-60 years) by – gynecological examination, PAP-test, colposcopy, cytomorphology (in case of necessity). Studied patients were divided by two groups according geographical location:
Group 1 – Rural Mountain Adjara (n=194; mean age - 41.58 ± 9.03 years);
Group 2 – Urban Seaside Adjara (n=581; mean age - 40.10 ± 8.85 years).

Specific questionnaires have been used to evaluate nutritional and behavioral characteristics (meal intake frequency; breakfast skipping; nutritional pattern: lack of proteins, carbohydrate- and fat-rich; sweets and snacks); Sleep regimen (duration, continuity, late bedtime, late wake up, insomnia). From socio-economic parameters we assessed education level, family status, occupational status, family income, etc.

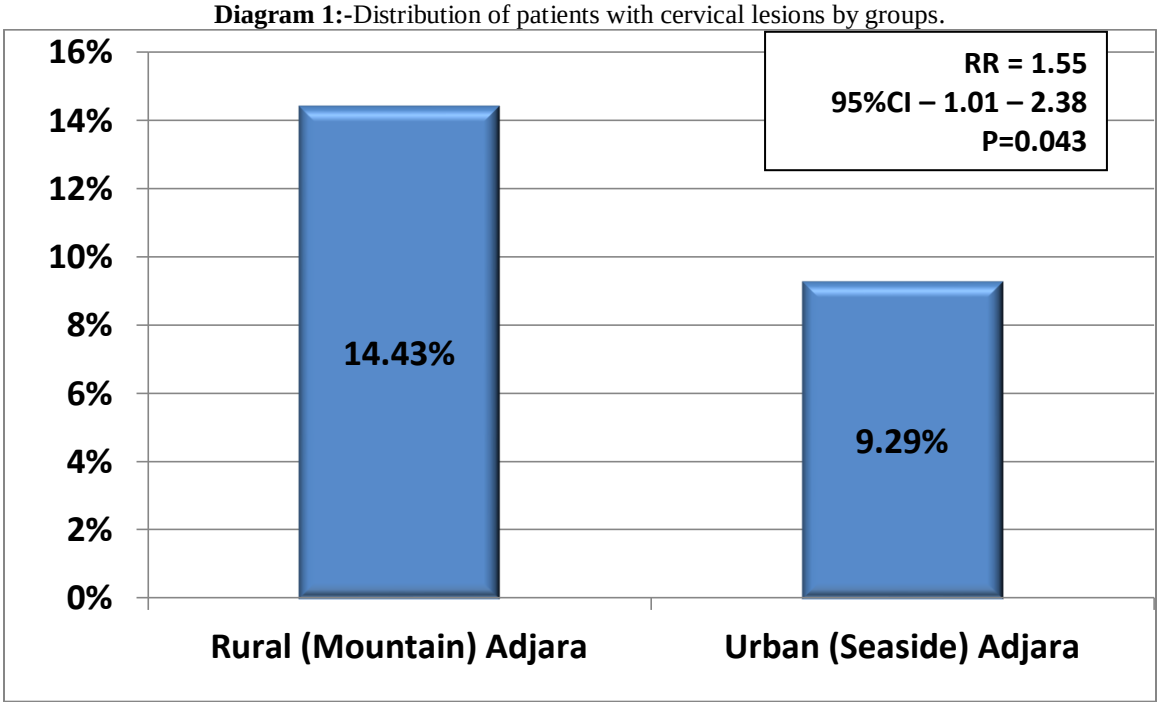
Statistical analyses were performed using SPSS software (version 22.0, SPSS, Chicago, IL, USA). Descriptive statistics were used to characterize the population using frequencies and means ± standard deviations (SDs). The two-tailed Chi-squared test was used for the statistical comparison of proportions, whereas continuous variables were tested using Student's t tests. Trends across demographic, socio-economic and behavioral risk-factors were analyzed using Chi-squared tests for categorical variables. The case-control study of age-adjusted data have been analyzed by estimation of Relative Risks (ORs) and corresponding 95% confidence intervals (95%CI). The case control ratio was 1:3. All statistical tests were 2-sided, and p-values less than 0.05 were considered statistically significant.

Results:-

Population Study.

Cervical lesions have been identified in 89 cases. The distribution of these cases by groups is presented on Diagram #1. It is showed that the patients with cervical lesions in Group 1 (n=28, 14.43%) was significantly higher than in women from seaside region (n=54, 9.29%; RR=1.55, p=0.043).

Diagram 1:-Distribution of patients with cervical lesions by groups.



To find out the reasons of above mentioned significant difference the demographic, socioeconomic and behavioral characteristics have been investigated. The results of this study in groups are given in Table #1.

Table #1 shows that the difference between age was not significant. Married women were significantly more in group 1 (mountain Adjara) compared to group 2 (seaside Adjara, p<0.001); the percentage of women with low family income and socially unprotected persons in group 1 was significantly higher than in group 2 (p<0.001).

Table 1:-Demographic, socioeconomic and behavioral characteristics in mountain and seaside Adjara groups

#	Characeristic	Group 1 – Mountain Adjara		Group 2 – Seaside Adjara		χ^2 (p)
		n=	%	n=	%	
1	**Age**					
	≤ 30 years	**32**	16,49%	**97**	16,70%	2.6835 (non-significant - NS)
	31-40 years	**70**	36,08%	**200**	34,42%	
	41-50 years	**58**	29,90%	**204**	35,11%	
	> 50 years	**34**	17,53%	**80**	13,77%	
2	**Marital Status**					
	Married	**185**	95,36%	**490**	84,34%	15.7368 (p<0.001)
	Unmarried	**3**	1,55%	**28**	4,82%	
	Divorced or Widow	**6**	3,09%	**63**	10,84%	
3	**Family Income**					
	Low or socially unprotected	**151**	77,84%	**72**	12,39%	300.73 (p<0.001)
	Middle	**43**	22,16%	**509**	87,61%	
4	**Food Meal Intake Habits**					
	Fat-rich food	**25**	12,89%	**26**	77,84%	16.74 (p<0.001)
	Carbohydrate-rich food	**45**	23,20%	**50**	8,61%	28.78 (p<0.001)
	Sweets and sneaks	**45**	23,20%	**89**	15,32%	5.77 (p=0.016)
	Breakfast skipping	**60**	30,93%	**177**	30,46%	NS
	Rare Meal Intake (<3)	**98**	50,52%	**292**	50,26%	NS
5	**Sleep Disorders**					

	Sleep continuity	**38**	19,59%	**66**	11,36%	7.78 (p=0.005)
	Chronic insomnia	**17**	8,76%	**16**	2,75%	11.45 (p<0.001)
	Drowsiness	**18**	9,78%	**4**	0,69%7	35.86 (p<0.001)

Study of risk-factors (Case-Control Study)

The results of statistical assessment of risk-factors in whole population (see Table #2) showed that marital status was not significant; family income was not significant too. Disorders related with food and meal intake habits showed that only breakfast skipping was significant risk-factor for cervical lessions (RR=2.67; 95%CI - 2.20÷3.23; p<0.001); it was also significant the disorders related with sleep: continuity (RR=1.61; 95%CI - 1.02÷2.55; p=0.041); chronic insomnia (RR=9.24; 95%CI - 4.83÷17.69; p<0.001); drowsiness (RR=34.68; 95%CI - 12.01÷100.18; p<0.001).

Table 2:-Demographic, socioeconomic and behavioral risk-facotrs of cervical lessions.

#	Characteristic	Group 1 – Cervical diseases (n=89)		Group 2 – Controls (n=267)		RR 95%CI (p)
		n=	%	n=	%	
1	**Age**					
	≤ 50 years	**73**	82,02%	**588**	85,71%	NS
	> 50 years	**16**	17,98%	**98**	14,29%	
2	**Marital Status**					
	Married	**81**	91,01%	**594**	86,59%	NS
	Unmarried	**7**	7,87%	**24**	3,50%	
	Divorce or widow	**1**	1,12%	**68**	9,91%	
3	**Family Income**					
	Low or socially unprotected	**21**	23,59%	**205**	29,88%	NS
	Middle	**68**	66,41%	**481**	70,12%	
4	**Food and Meal Intake Habits**					
	Fat-rich food	**6**	6,74%	**45**	6,56%	NS
	Carbohydrate-rich food	**8**	8,99%	**87**	12,68%	NS
	Sweets and Sneaks	**8**	8,99%	**126**	18,37%	NS
	Breakfast skipping	**61**	68,94%	**176**	25,66%	2.67 2.20-3.23 (p<0.001)
	Rare meal intake (<3)	**40**	44,94%	**350**	51,02%	NS
5	**Sleep Disorders**					
	Sleep continuity	**18**	20,22%	**86**	12,53%	1.61 1.02-2.55 (p=0.041)
	Chronic insomnis	**18**	20,22%	**15**	2,18%	9.24 4.83-17.69 (p<0.001)
	Drowsiness	**18**	20,22%	**4**	0,58%	34.68 12.01-100.18 (p<0.001)

Discussion:-

Wen X et al. (2019) showed that the age-standardized incidence rate (ASIR) of cervical cancer in rural Shexian County (China) was 3 times higher than in Shijiazhuang city in 2012 (25.0 vs. 8.4 per 100,000 per year, p<0.01) . This high value in rural region was partially explained by lack of access to screening centers. They also noted that it was not impossible to carry out cytologic studies in rural ambulatories.

Some epidemiologic studies revealed that the some food or macro- and micronutrients may be used for the prevention of the progression from precancer- to cancer-state. „European Prospective Investigation into Cancer and Nutrients" (EPIC) has showed significant inverse correlation between cervical cancer and daily fruit intake (González CA, 2011). In particular, the intake of fruit and vegetables, vitamins A, C, and E, folates, carotinoids and minerals were associated with the decreased risk HPV infection, CIN and cervical cancer (Zhang X. et al., 2012;

Zhou X. et al., 2016; Cao D. et al., 2016; Hwang J.H. et al., 2010; Siegel E.M. et al., 2010; Guo L. et al., 2015; Kim J. et al., 2010; Tomita L.Y., 2010; Piyathilake C.J. et al., 2004). These findings were indicated on the protective role of vitamins in the suppression of cancer cell proliferation (García-Closas R. et al., 2005), p53 stabilization (Reddy L. et al., 2003), prevention of DNA damages and decrease of immunity suppression (García-Closas R. et al., 2005; Field C.J. et al., 2002) [18,20] during cervical cancer development.

According very few data about the role of lifestyle on the cervical damages showed that alcohol overconsumption, the absence of adequate sleep and physical inactivity had significant association with CIN; however most significant risk-factor remains smoking (Lukac A. et al., 2018; Comparetto C. and Borruto F., 2015; Parada R. et al., 2010).
We could not find out the data about the impact of sleep and meal intake habits (breakfast skipping, the frequency of meal intake) on the development of cervical lesions.

Conclusions:-

Rural mountain Adjara habitants have significantly high prevalence of cervical lesions compared to urban Adjara habitants. Family income is main socio-economic risk-factor for the development of cervical lesions in rural Adjara region. Food and meal intake habits, sleep disorders are associated with cervical lesions in whole region. Among of them are breakfast skipping (RR=2.67; $p<0.001$), sleep discontinuity (RR=1.61; $p=0.041$), insomnia (RR=9.24; $p<0.001$), and drowsiness (RR=34.68; $p<0.001$).

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