eNOS AND VEGF VARIANTS MIGHT INCREASE THE RISK OF PANCREATIC CANCER

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Endothelial nitric oxide synthase (eNOS) is essential in chronic inflammation and carcinogenesis. The association between variants in vascular endothelial growth factor (VEGF) and several cancers still remains uncertain. We studied whether there is a relation between eNOS/VEGF variants and risk of pancreatic cancer (PC). This prospective case-control study included 76 PC patients (28 women and 48 men) and 100 healthy controls. Blood samples from all participants were genotyped for eNOS variable number tandem repeat (VNTR) and VEGF insertion/deletion (I/D) variants by PCR. There was a significant difference between groups for the eNOS intron 4 VNTR genotype distributions ($p = 0.01$). eNOS 4a/4b and 4b/4b genotypes were higher in patients with PC group compared to controls while eNOS 4a/4b genotype was more prevalent in control group than in patient group. Significant differences were observed between groups for the VEGF I/D variant genotype and allele frequencies ($p < 0.00$, and $p < 0.00$). VEGF I/D variant I/I genotype and I allele increased in patient group than controls. A statistically significant association was observed when the patients were compared with the controls according to D/D+D/I versus D/D ($p < 0.00$, OR: 0.094, 95 % CI: 0.03–0.22) We provided evidence that eNOS VNTR and VEGF I/D variants might influence the development of PC.

***Key words**: pancreatic cancer, eNOS, VEGF, variant.*

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ВАРІАНТИ eNOS І VEGF МОЖУТЬ ПІДВИЩУВАТИ РИЗИК РАКУ ПІДШЛУНКОВОЇ ЗАЛОЗИ

Ендотеліальна синтаза оксиду азоту (eNOS) є надзвичайно важливим чинником при хронічному запаленні та канцерогенезі. Зв'язок між варіантами фактору росту ендотелію судин (VEGF) і декількома видами раку все ще недостатньо вивчений. Ми вивчали можливу наявність зв'язку між варіантами eNOS/VEGF і ризиком раку підшлункової залози (РПЗ). До цього проспективного дослідження типу «випадок-контроль» було залучено 76 пацієнтів з раком підшлункової залози (РПЗ) (28 жінок і 48 чоловіків) і 100 здорових осіб для контролю. Зразки крові від усіх учасників дослідження генотипували на наявність тандемних повторів зі змінною кількістю ланок (VNTR) *eNOS* та варіантів *VEGF* з включенням/делецією (В/Д) за допомогою ПЛР. Було виявлено суттєву відмінність між групами щодо розподілу генотипів VNTR 4 інтрона *eNOS* ($p = 0,01$). Генотипи *eNOS* 4a/4b і 4b/4b були вищими у пацієнтів з РПЗ порівняно з контрольною групою, в той час як генотип eNOS 4a/4b був превалюючим для контрольної групи порівняно з пацієнтами, що мали РПЗ. Між групами щодо варіанту *VEGF* з включенням/делецією і частотами алеля ($p < 0,00$ і $p < 0,00$) спостерігали значні відмінності. Варіант VEGF з включенням/включенням і алель І мали підвищений рівень у групі пацієнтів порівняно з контрольною. Під час порівняння пацієнтів з РПЗ та контрольної групи було виявлено статистично значимий зв'язок щодо делеції/делеції + делеції/включення порівняно з делецією/делецією ($p < 0,00$, співвідношення шансів: 0,094, 95 % довірчий інтервал: 0,03–0,22). Ми отримали докази того, що варіанти *eNOS* VNTR і *VEGF* В/Д можуть мати вплив на розвиток РПЗ.

Ключові слова: рак підшлункової залози, *eNOS, VEGF*, варіант.

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