Factor V 1691 G-A mutation distribution in a healthy Turkish population

Sağlıklı Türk popülasyonunda faktör V (1691 G-A) mutasyon sıklığı

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Abstract

The aim of this review was to compile published data on factor V 1691 G-A alteration in a healthy Turkish population and also to stimulate the reporting of unpublished data, in order to create a map for factor V Leiden (FVL) in Turkey. From a total of 4276 healthy individuals from 26 different centers of Turkey, 345 FVL carriers (7.9%) were determined. FVL was strikingly high among newborns from two different centers (10.9%). *(Turk J Hematol 2009; 26: 9-11)*
Key words: Factor V, Turkish

Received: January 14, 2008 Accepted: September 10, 2008

Özet

Bu gözden geçirme makalesinde amaç, Faktör V 1691 G-A değişiminin sağlıklı Türk popülasyonunda yayınlanmış çalışmaların derlenmesi ve yayınlanmamış verilerin de yayınlanmasının sağlanmasıdır. Bu çalışmada 26 farklı bölgeden, FVL tayini yapılmış 4276 bireyden 345 bireyin taşıyıcı olduğu (% 7,9) belirlenmiştir. Yenidoğanlarda yapılmış iki çalışmada FVL taşıyıcı sıklığı % 10,9 olarak saptanmıştır. *(Turk J Hematol 2009; 26: 9-11)*
Anahtar kelimeler: Faktör V, Türk

Geliş tarihi: 14 Ocak 2008 Kabul tarihi: 10 Eylül 2008

Factor V Leiden (1691 G-A) (FVL) causes activated protein C resistance and is the most common thrombophilic mutation worldwide. Guanine to adenine change leads to a replacement of glutamine to arginine at amino acid position 506. It is most prevalent among Caucasians but not found in Japanese and Africans [1,2].

Anatolia is at the crossroads of different civilizations and lies central to three continents. Thus, it is logical that different frequencies could be expected in different parts of the country. However, as FVL is presumed to have originated from the Middle East some 15,000-30,000 years ago, high frequency among the Turkish population can be expected [3].

The data in this review was compiled from PubMed and Science Citation Index databases. “Factor V Leiden, Factor V 1691 G-A, FVL” were used as key words and cross-searched with the key words “Turkish population and Turkey”. The first publication from each center was included in the study. Published studies with their geographical region, number of controls, number

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of individuals carrying FVL and references are given in Table 1. Two studies from Ankara and Bursa were performed among newborns and are shown in Table 2.

FVL frequency in the Turkish population has been reported from different parts of Turkey. Frequency was reported to range between 3.5 to 15% in several studies [4-29]. This wide range may be explained by either the small sample size of the studies or by geographical location of the previous studies. However, it is interesting that when all the published controls were summed, a frequency of 7.9% of carriers was found (4276 individuals with 345 FVL heterozygous carriers). Ankara and Istanbul are metropolitan cities and given the composition of their populations, both cities represent a good example for screening studies of the Turkish population. When the published related studies were reviewed, FVL frequency was determined as 7.5% in Ankara and 8.3% in Istanbul. These two values are almost identical to the sum of all published controls for FVL frequency.

Table 1. Distribution of factor V Leiden among the Turkish population

Region	Number of controls	FV 1691 A	%	Reference
Adana	77	4	5.2	4
Ankara	285	28	9.8	5.30
Ankara	81	6	7.1	6
Ankara	50	3	6.0	7
Ankara	80	5	6.25	8
Ankara	100	4	4	9
Aydın	47	2	4.3	10
Black Sea	103	16	15	11
Denizli	1030	87	8.41	12
Diyarbakır	151	7	4.6	13
Diyarbakır	320	29	9.1	14
Diyarbakır	27	3	11.1	15
Erzurum	78	0	0	16
İstanbul	120	11	9.2	17
İstanbul	107	11	10.3	18
İstanbul	86	8	9.3	19
İstanbul	66	6	9	20
İstanbul	114	4	3.5	21
İstanbul	191	17	8.9	22
İzmir	33	5	7.6	23
İzmir	37	0	0	24
Mersin	95	5	5.26	25
South East	185	13	7	26
Southern	264	23	8.7	27
Trabzon	95	7	7.3	28
Trace	476	20	4.28	29
Turkish Cypriots	99	12	12.2	5

Table 2. Distribution of factor V Leiden among Turkish newborns

Region	n	FV 1691 A	%	Reference
Ankara	137	15	11.9	30
Bursa	250	26	10.4	31
Balkan immigrants	137	15	10.9	
Others	123	10	8	

It is interesting to find FVL strikingly high among newborns from two different centers, i.e. Ankara and Bursa [30,31]. Although there are only two reports, a marked difference between adult and newborn frequency may have importance (7.9% vs 10.9%). This calls to mind the question, "Did some of the infants with FVL mutation die of clinical conditions related with thromboembolism before reaching adult age and without receiving a specific diagnosis?" This may explain the difference between the frequencies in newborns and adults [30,32]. Although the difference was not statistically significant in our data (p: 0.06), if this hypothesis is verified by other studies, it will be a very important finding from an evolutionary point of view.

FV 1691 G-A mutation was found to be 12.2% in Turkish Cypriots [5]. Previous studies revealed the allele frequency to be 8.0% in Greek Cypriots [33]. Thus, it can be said that the prevalence of this particular mutation is very high in Turkish Cypriots, almost similar to that of thalassemia syndromes, which are the commonest genetic disease in Cyprus. As Cyprus is an island, finding a high frequency of FVL seems logical [34]. The difference between the two communities may be explained by the first Turkish immigration in 1570 from middle Anatolia, and then again in 1974. Further, it is well known that while Muslim men marry Christian women, it is very rare for Muslim women to marry Christian men. With these two mentioned points, the different incidence between the two populations, although they co-exist on the same island, can be expected.

In conclusion, this review was undertaken in order to compile the previously reported data and also to stimulate the reporting of unpublished data, in order to create a map for FVL in Turkey.

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