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Letter to the Editor

Worldwide Distribution of PK Deficiency: the Defect Seems Mainly Concentrated in West African Countries and the United States

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To the editor.

PK deficiency was first reported in 1965 in the USA in a family composed of a Caucasian woman and an African American (AA). The woman was an unrecognized heterozygote for PK deficiency, whereas the AA man was either an unrecognized heterozygote or a homozygote for the same defect.[1]

Two of their children were homozygotes for the defect.[2]

After these publications, several cases appeared.[3] Sollo and Saleem were the first ones in 1985 who, based on a table in which they gathered most of the papers published on the subject, suggested that the defect was frequent among AA.[4]

Subsequently, studies confirmed this assumption. The history of African Americans who had been brought "forcefully" to the US as "slaves" indicated that the defect should be frequent in the West African States where they came from.[5,6]

Until now, PK defect appeared rare in these countries.[7] Recently, in a preliminary study, it has been demonstrated that the defect is present in 1.27% of 300 Nigerians.[8] The defect was found to be due to a Ser151Pro fs mutation. Interestingly, the only AA investigated was found to have the same mutation.[9] This is the first genetic link established between African-Americans and the African population.

The link had been suspected on historical consideration[5,6] but not genetically.

It remains to be proven if this is the only mutation present among AA or, more likely, other mutations will be discovered.

This mutation is different from the mutations found in Europeans, Asians, and Argentinians.[3] It is interesting to know that the same mutation was also found in a patient from Oman and Somalia (East African States).[8] This could indicate that the mutation may be present even in the Central African States.

These findings, if confirmed and extended, could cast some light on the high frequency of Cardiovascular Disorders (CVD) seen among AA.[10-12] It would also allow the possibility to differentiate the effects of a genetic abnormality from diet and environment, which have been and still are quite apart between the USA and African countries.

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References:

1. Hathaway WE, Belhasen LP, Hathaway HS. Evidence for a new plasma thromboplastin factor. I. Case report, coagulation studies and physicochemical properties. Blood. 1965;26:521-532. https://doi.org/10.1182/blood.V26.5.521.521 PMid:5845778
2. Hathaway WE, Wuepper KD, Weston WL, Humbert JR, Rivers RP, Genton E, August CS, Montgomery RR, Mass MF. Clinical and physiologic studies of two siblings with prekallikrein (Fletcher factor) deficiency. Am J Med. 1976;60:654-664. https://doi.org/10.1016/0002-9343(76)90500-3
3. Girolami A, Scarparo P, Candeo N, Lombardi AM. Congenital prekallikrein deficiency. Expert Rev Hematol. 2010;3:685-595. https://doi.org/10.1586/ehm.10.69 PMid:21091145
4. Sollo DG, Saleem A. Prekallikrein (Fletcher factor) deficiency. Ann Clin Lab Sci. 1985;15:279-285.

5. Girolami A, Ferrari S, Cosi E, Girolami B. The high prevalence of Prekallikrein deficiency among African Americans deserves further studies. Hematol Med Oncol. 2020;5:1-2. https://doi.org/10.15761/HMO.1000201
6. Girolami A, Ferrari S, Cosi E, Girolami B. Increased Prevalence of Reported Cases of Congenital Prekallikrein Deficiency Among African Americans as Compared With the General Population of the United States. Clin Appl Thromb Hemost. 2020;26:1-3. https://doi.org/10.1177/1076029620918301 PMid:32243188 PMCid:PMC7288793
7. Essien EM, Ebhota MI. Fletcher Factor Deficiency - Detection of a Severe Case in a Population Survey. Acta Haematol. 1977;58:353-358. https://doi.org/10.1159/000207849 PMid:413313
8. Adenaeuer A, Ezigbo ED, Nazir HF, Barco S, Trinchero A, Laubert‐Reh D, Strauch K, Wild PS, Lackner KJ, Lämmle B, Rossmann H. c.451dupT in KLKB1 is common in Nigerians, confirming a higher prevalence of severe prekallikrein deficiency in Africans compared to Europeans. J Thrombo Hemostas. 2020. https://doi.org/10.1111/jth.15137 PMid:33073460
9. Dasgupta SK, Rivera S, Thiagarajan P. Lisinopril-Induced Angioedema in a Patient with Plasma Prekallikrein Deficiency. TH Open. 2020;4:e33-e35. https://doi.org/10.1055/s-0040-1701238 PMid:31984307 PMCid:PMC6978173
10. Mendy VL, Vargas R, Payton M, Sims JN, Zhang L. Trends in the Stroke Death Rate Among Mississippi Adults, 2000-2016. Prev Chronic Dis. 2019. 14;16:E21. https://doi.org/10.5888/pcd16.180425 PMid:30767859 PMCid:PMC6395077
11. Colantonio LD, Monda KL, Rosenson RS, Brown TM, Mues KE, Howard G, Safford MM, Yedigarova L, Farkouh ME, Muntner P. Characteristics and Cardiovascular Disease Event Rates among African Americans and Whites Who Meet the Further Cardiovascular Outcomes Research with PCSK9 Inhibition in Subjects with Elevated Risk (FOURIER) Trial Inclusion Criteria. Cardiovasc Drugs Ther. 2019;33:189-199. https://doi.org/10.1007/s10557-019-06864-2 PMid:30746585 PMCid:PMC6917479
12. Waldron FA, Benenson I, Jones-Dillon SA, Zinzuwadia SN, Adeboye AM, Eris E, Mbadugha NE, Vicente N, Over A. Prevalence and risk factors for hypertensive crisis in a predominantly African American inner-city community. Blood Press. 2019;28:114-123. https://doi.org/10.1080/08037051.2019.1568183 PMid:30669866