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The incidence of congenitally absent foot pulses

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The pedal pulses of 547 young healthy subjects were examined using digital palpation and a Doppler probe to determine the incidence of congenitally absent foot pulses.

The posterior tibial (PT) pulse was absent in only one subject (0.18%), while the dorsalis pedis (DP) pulse was bilaterally absent in nine subjects (1.8%) and unilaterally absent in a further six subjects.

The low incidence of congenital absence makes the clinical finding of an absent pedal pulse in later life a more significant marker of peripheral vascular disease than current surgical texts would have us believe.

The palpation of arterial pulses in the lower limb is an essential part of the clinical examination of anyone with symptoms suggestive of peripheral vascular disease. The presence of foot pulses often being confirmed using a Doppler ultrasonic velocity detector. However, the incidence of congenital absence of these pulses, and the significance of their absence in later life is unknown.

Hamilton Bailey *(1)* describes how to feel the pedal pulses, and notes that "in 10% of persons the dorsalis pedis artery is congenitally absent from its usual position, and therefore lack of its pulsation is valueless unless corroborated by other signs of obliterative vascular disease." He also notes that the posterior tibial artery is "sometimes difficult to feel and absolute reliance cannot be placed upon the absence of its pulsation."

Gray's Anatomy (2) whilst confirming that the DP artery may be replaced by a large perforating branch of the peroneal artery and that the peroneal artery when large may take the place of the PT artery, does not suggest an incidence for these anomalies.

The aim of this study was to establish the incidence of absent pedal pulses in healthy young people, in whom their absence may be construed as being congenital rather than secondary to arterial disease.

Methods

Two groups of subjects were used.

Group A consisted of 224 randomly selected individuals between 15 and 30 years of age.

Group B consisted of 323 Leicestershire school children between the ages of 9 and 10 years.

In both groups the DP and PT pulses were palpated using the technique described by Hamilton Bailey. If the pulses were not clearly palpable a portable Doppler probe was used to detect the pulsatile arterial flow. Pulses which could not be detected with either method were defined as congenitally absent.

Results

A total of 547 people were examined in the two groups.

Group A (Table I) consisted of 224 people—160 female and 64 male. In all 224 subjects the PT pulse was digitally palpable.

In seven people (3.1%) the DP pulse was not palpable but in four of these it was detectable using the Doppler probe. This left three (1.3%) people in whom the DP pulse was deemed to be congenitally absent.

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Table I. The number of absent pulses in Group A

	Female (n = 160)	*Male (n = 64)*	*Total (n = 224)*
DP bilaterally impalpable	4	3	7
DP bilaterally absent on Doppler examination	2	1	3

Table II. The number of absent pulses in Group B

	Female (n = 170)	*Male (n = 153)*	*Total (n = 323)*
DP bilaterally impalpable	6	9	15
DP bilaterally absent on Doppler examination	1	5	6
DP unilaterally impalpable	2	3	5
DP unilaterally absent on Doppler examination	4	2	6
PT bilaterally impalpable	5	2	7
PT bilaterally absent on Doppler examination	1	0	1

In all seven individuals the findings were identical in both feet.

In Group B (Table II) 323 children—170 female and 153 male—were examined.

In seven children the PT pulses were impalpable, but in only one girl were they undetectable using the Doppler probe.

In 20 children either both (15) or one (5) DP artery was impalpable. Using the Doppler probe only six children (1.8%) had bilaterally absent pulses, while a further six had either the left (2) or the right (4) absent.

In both groups the PT artery was found to be constant in position. The position of the DP artery was much more variable and on occasions was found between the 2nd and 3rd metatarsals.

Looking at the two groups, in only 15 subjects (2.7%) was a DP artery found to be congenitally absent, and in only one girl (0.18%) was absence of both PT pulses noted. There was no significant sex difference in any of the findings ($P>0.1$).

Discussion

The incidence of congenitally absent foot pulses is clearly considerably lower than standard surgical works have anecdotally led us to believe, though the incidence of impalpable pulses (4.7%) is more consistent with their teaching.

We believe that our results show that an absent pedal pulse, especially one which is absent using the Doppler probe, is a significant indicator of peripheral vascular disease and can very rarely be regarded as a congenital anomaly.

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References

1 Clain A ed. *Hamilton Bailey's Demonstrations of Physical Signs in Clinical Surgery*, 16th edition. Bristol: John Wright, 1980:379.

2 Warwick R, Williams PL eds. *Gray's Anatomy*, 35th edition. London: Longman Group Ltd, 1973:682–3.

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