ANNALES
UNIVERSITATIS MARIAE CURIE-SKŁODOWSKA
LUBLIN – POLONIA
VOL. LXII, N 1, 22 SECTIO D 2007

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The variability of diameter of common iliac artery in different periods of human's life

MATERIAL AND METHODS

The study was conducted on 220 unfixed human bodies of both sexes, including 110 males and 110 females, aged 7 months of fetal life till 82 years (Table 1, 2). The number of individuals in all the examined groups depended on the material accessibility. The children groups were divided based on the psychosomatic development.

Table 1. The proximal and distal diameters of the common iliac artery in females

Age	n	Proximal diameter						Distal diameter					
		right			left			right			left		
		min.	max.	mean	min.	max.	mean	min.	max.	mean	min.	max.	mean
7 m.pr.l.	4	2.0	2.6	2.28	2.3	2.8	2.58	1.9	2.5	2.25	2.0	2.4	2.20
8 m.pr.l.	3	2.3	3.8	3.13	2.7	4.0	3.30	2.2	3.7	3.07	2.7	3.4	3.03
9 m.pr.l.	3	2.8	3.6	3.33	2.9	3.7	3.17	2.8	3.3	3.03	3.0	3.8	3.30
Newborns	10	2.7	4.0	3.12	2.8	4.6	3.32	2.4	4.2	3.08	2.3	4.1	3.19
1–3 m.p.l.	2	2.8	3.3	3.05	3.2	3.7	3.45	3.0	3.5	3.25	2.6	3.6	3.10
4–6 m.p.l.	5	3.9	4.9	4.42	3.8	5.2	4.42	4.0	5.5	4.66	3.6	5.0	4.40
7–11 m.p.l.	3	4.5	5.4	4.80	4.9	5.7	5.30	3.7	4.9	4.33	4.7	5.9	5.23
1–3 years	4	3.9	5.6	4.65	4.0	5.2	4.55	4.0	5.3	4.68	3.7	4.8	4.28
4–6 years	3	5.8	6.8	6.27	5.5	7.0	6.27	5.6	6.6	6.23	5.3	7.2	6.20
7–9 years	3	7.0	7.8	7.27	6.9	7.7	7.40	6.3	7.2	6.77	6.6	7.6	7.17
10–12 years	2	6.1	7.9	7.00	6.3	8.0	7.15	6.8	8.1	7.45	5.6	7.9	6.75
13–16 years	3	8.4	9.4	8.87	8.2	9.0	8.67	8.1	9.6	8.80	7.7	8.8	8.33
17–19 years	5	8.9	10.7	9.88	9.2	11.7	10.28	9.0	11.0	9.84	8.6	10.9	9.70
20–29 years	10	8.5	12.1	11.66	9.5	11.0	10.13	8.7	11.8	10.58	9.2	11.6	10.18
30–39 years	10	11.1	13.6	12.59	11.5	13.8	12.24	11.2	12.9	12.09	10.9	13.5	12.17
40–49 years	10	10.4	13.7	11.75	9.3	12.8	11.23	9.9	12.3	11.54	8.9	12.6	11.16
50–59 years	10	11.4	16.0	14.05	12.8	15.8	14.71	11.8	15.6	13.88	13.2	16.5	14.68
60–69 years	10	11.6	15.3	13.19	12.0	15.1	13.45	12.2	14.4	13.04	10.8	14.7	13.21
≥70 years	10	12.4	16.5	14.87	11.9	16.8	14.58	10.9	16.4	14.46	11.7	16.1	14.52

m.pr.l. – months of prenatal life; m.p.l. – months of postnatal life

The proximal diameter of the common iliac artery was measured in place of ramification from aorta. The distal diameter was measured in the place where artery divided into internal and external trunk. All the measurements were done using the linear dimensions with exactitude to 0.1 mm.

The data were statistically analyzed using Mann–Whitney U test. An $\alpha = 0.05$ ($p<0.05$) was considered significant.

Table 2. The proximal and distal diameters of the common iliac artery in males

Age	n	Proximal diameter						Distal diameter					
		right			left			right			left		
		min.	max.	mean	min.	max.	mean	min.	max.	mean	min.	max.	mean
7 m.pr.l.	2	1.9	2.3	2.10	2.1	2.8	2.45	1.6	2.7	2.15	1.8	2.0	1.90
8 m.pr.l.	6	2.5	3.5	3.12	1.9	3.6	2.65	2.1	3.0	2.60	1.6	3.8	2.70
9 m.pr.l.	2	2.9	3.1	3.00	2.5	4.0	3.25	2.5	3.8	3.15	2.7	3.6	3.15
Newborns	10	2.5	4.4	3.59	3.1	4.6	3.79	2.8	4.3	3.54	2.3	4.6	3.61
1–3 m.p.l.	4	3.2	3.9	3.43	3.1	4.2	3.55	3.0	3.8	3.25	2.9	4.0	3.50
4–6 m.p.l.	3	3.0	4.8	4.10	3.4	4.0	3.70	3.6	4.6	4.03	2.6	4.2	3.40
7–11 m.p.l.	3	4.4	5.8	5.13	4.8	5.6	5.20	5.1	5.2	5.17	4.8	5.3	5.03
1–3 years	6	3.8	6.0	4.73	4.1	5.8	4.65	3.7	5.4	4.38	3.5	5.7	4.68
4–6 years	2	6.2	7.0	6.60	5.7	6.9	6.30	6.0	6.2	6.10	5.9	6.7	6.30
7–9 years	2	6.8	8.1	7.45	7.2	7.6	7.40	7.0	7.7	7.15	6.7	7.9	7.30
10–12 years	3	6.6	8.3	7.23	7.1	8.0	7.63	6.8	8.1	7.33	6.4	7.5	7.10
13–16 years	1	8.7			9.4			8.4			9.0		
17–19 years	6	8.3	11.1	9.18	8.7	10.4	9.40	7.7	10.9	9.03	8.9	10.1	9.30
20–29 years	10	8.7	10.8	9.62	7.9	11.8	9.35	8.2	10.6	9.45	7.6	10.3	9.05
30–39 years	10	8.6	13.4	11.81	9.5	13.0	11.16	9.5	12.7	11.30	8.8	12.9	10.92
40–49 years	10	9.4	11.9	10.41	8.5	11.6	9.99	8.9	11.2	10.22	8.1	11.4	9.74
50–59 years	10	9.7	12.7	11.61	9.9	12.5	11.08	10.0	12.9	11.68	9.3	12.2	11.06
60–69 years	10	9.4	14.0	12.04	11.0	14.7	12.95	9.6	14.3	11.57	10.5	14.4	12.68
≥70 years	10	11.4	15.3	13.47	11.6	14.4	12.76	10.9	14.9	13.08	11.3	13.9	12.65

m.pr.l. – months of prenatal life; m.p.l. – months of postnatal life

RESULTS

The absolute proximal and distal diameters of the common iliac arteries depended on age (Table 1, 2). The statistical differences were noted between all the examined age groups. Such results were observed independently of sex or body side. The greatest changes in both absolute and relative values were revealed in adult group of males aged 50–59 years and 60–69 years in females.

No statistically significant differences in distal/proximal ratio were found between the left and the right side, both in males and females (Fig. 1).

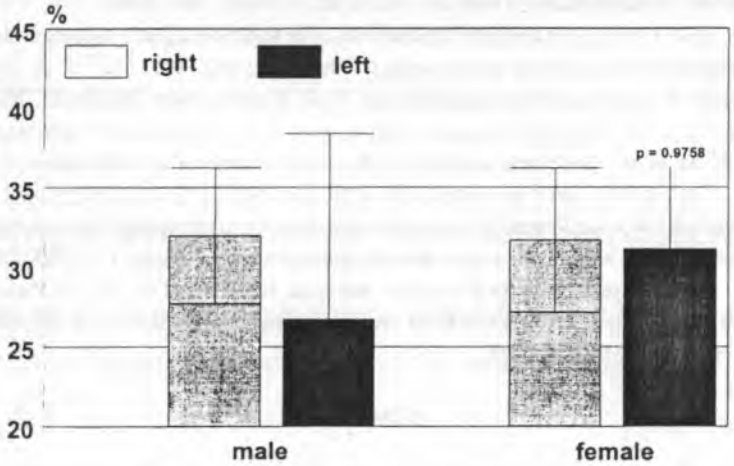

Fig. 1. Relation of distal diameter to proximal diameter of the common iliac arteries in both sexes

DISCUSSION

The dependence of diameter of the common iliac arteries in the conducted investigations was showed in different developmental periods connected with man's age.

The diameter of the common iliac artery in the adult corpses in Adachi's investigations (1) was 6 –11 mm long, most often 7 mm long. According to Bochenek (2), it was 8–14 mm, 11 mm on the average. Buxton et al. (3) measured initial and final diameters. They were 9.1 and 9.2 mm long. Lassa's researched the diameters of the right artery (8.9 mm) and of the left artery – 8.3 mm (6); the values of this dimension were in the range of in 5–12 mm. According to Poirier (7), the diameter of the common iliac artery is 11 mm long and according to Schroeter (9) – 11–12 mm long and it is even on both sides. According to Sali et al. (8), the diameter of this artery is 12 mm long. Shah et al. (10) explored the diameter in both sexes. In males the diameter of the right artery was from 10 to 15 mm, and of the left artery 9–16 mm. In females the diameter of the right artery was from 9 to 16 mm, and of the left artery from 8 to 16 mm. In Testut's research (12) the discussed dimension was 6.5 mm long, and in Worobiew's (13) – 10–12 mm. The authors affirm that the diameter of the common iliac artery grows up along with age (2, 4, 5, 11).

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SUMMARY

The dynamic development of radiological methods, the method of direct preparation of tissues and analysis of individual vascular branches stays preferred in traditional anatomical investigations still. The aim of the work was to evaluate the diameter of the common iliac artery in different periods of man's life. The study was conducted on 220 unfixed human bodies of both sexes, including 110 males and 110 females, aged 7 months of fetal life till 82 years. The proximal diameter of the common iliac arteries in places of ramification from aorta and distal diameter of these arteries just before their final division were measured. The dependence of diameter of the common iliac arteries in conducted investigations was showed in different developmental periods connected with man's age. No statistically significant differences in distal/proximal ratio were found between the left and the right side, both in males and females.

Zmienności średnicy tętnicy biodrowej wspólnej w różnych okresach życia człowieka

Znajomość odmian anatomicznych jest niezmiernie pomocna nie tylko w radiologii zabiegowej i chirurgii naczyniowej, ale również w wielu innych dziedzinach medycyny, m.in. chirurgii ogólnej i onkologicznej, a także w położnictwie i ginekologii. Celem pracy była ocena średnicy tętnic biodrowych wspólnych w różnych okresach życia człowieka. Badania przeprowadzono na 220 zwłokach nieformalinowanych obu płci, w tym 110 osobników męskich i 110 osobników żeńskich w wieku od 7 miesiąca życia płodowego do 82 roku życia, u których nie stwierdzono zmian patologicznych w obrębie miednicy. W badanym materiale dokonywano pomiarów średnicy początkowej tętnic biodrowych wspólnych w miejscu odejścia od aorty oraz średnicy końcowej tych tętnic tuż przed ich końcowym podziałem. Uzyskane wyniki poddano ocenie statystycznej. Wykazano, że wymiary bezpośrednie naczynia zależały od wieku osobniczego. Statystycznie istotne różnice obserwowano miedzy poszczególnymi grupami wiekowymi. Największe różnice zarówno w wymiarach bezpośrednich, jak i pośrednich obserwowano u osobników płci męskiej w wieku 50–59 lat oraz w grupie kobiet w wieku 60–69 lat. Obserwowane różnice nie zależały od płci i strony ciała.