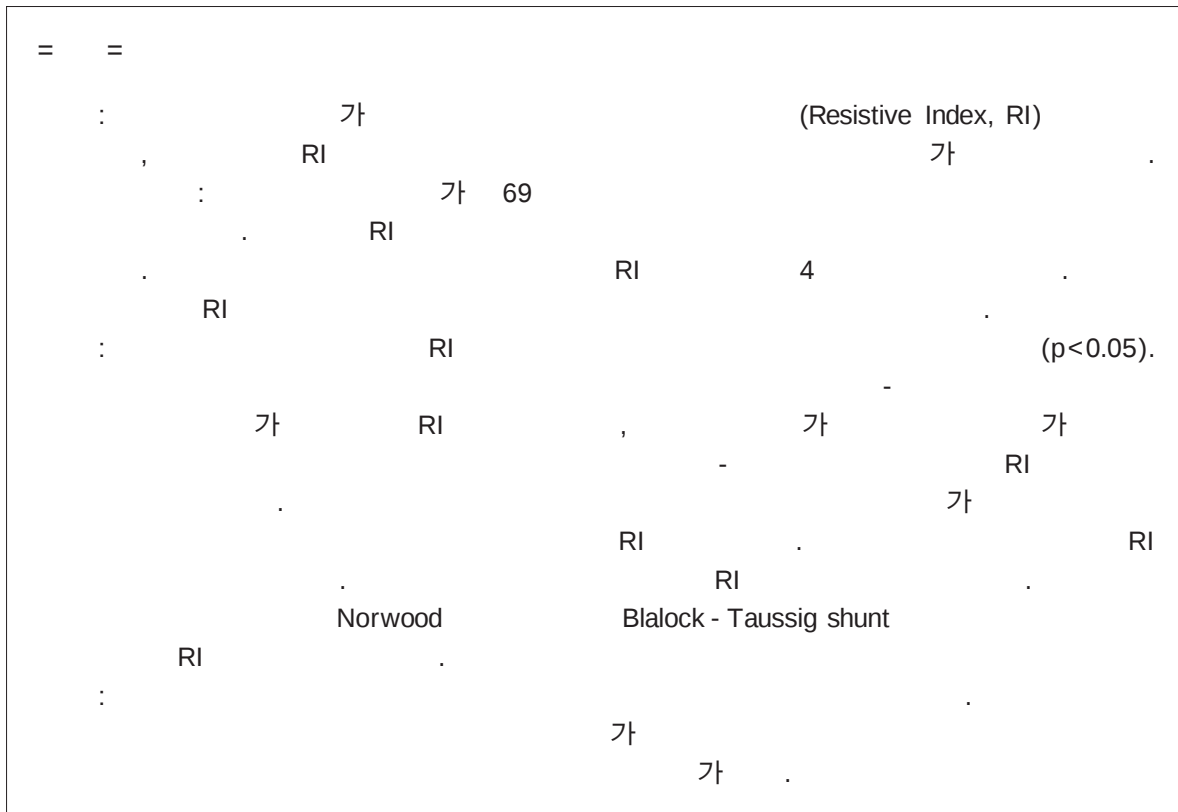


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*, **, ***, ****

*, **, **, **, ***, ****



: Ultrasound (US), Doppler Studies
Brain
Brain, blood flow

. 1979

Bada [2]

가

가

가

[2 - 11].

[1].

: 2002 7 25 , :2002 12 30 , :2003 2 24 , : 2003 30 10
: , (135 - 270) 146 - 92,
Tel. (02)3497 - 3156 Fax. (02)3462 - 5472 E - mail: pubmed@naver.com

(anterior fontanelle)

(resistive index, RI)

0.65 - 0.75

[9, 12].

[13, 14].

RI

RI

[9, 13, 15 - 18].

가

가

가

RI

가

가

RI

of corpus callosum)

(genu

3

(Fig. 1).

CT

2001 1 2001 12

69

37.5 (31.1 - 41.3),

2764 g(1200 - 4250 g)

2001 9

Acuson 128XP

(Acuson, Mountainview, CA, U.S.A.)

HDI 5000(Advanced Technology Laboratories, Bothell, WA, U.S.A.)

5 - 7 MHz

13.3

(0 - 30)

가

가

RI

(RI 0.80) [1]

RI

RI

1 :

2 :

3 :

4 :

1

2

RI

RI

RI

RI

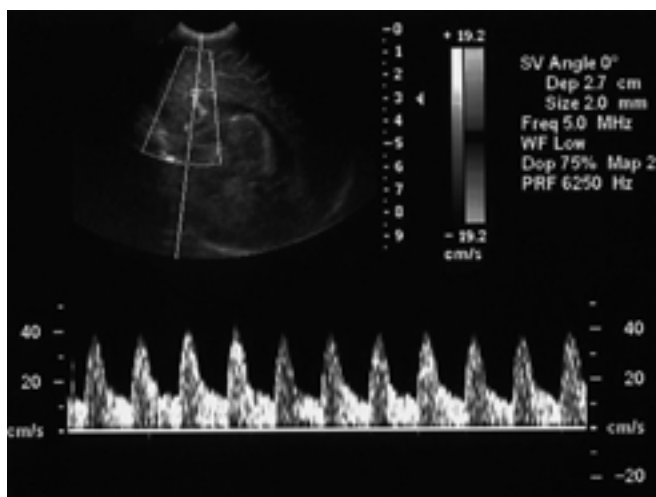
RI

3

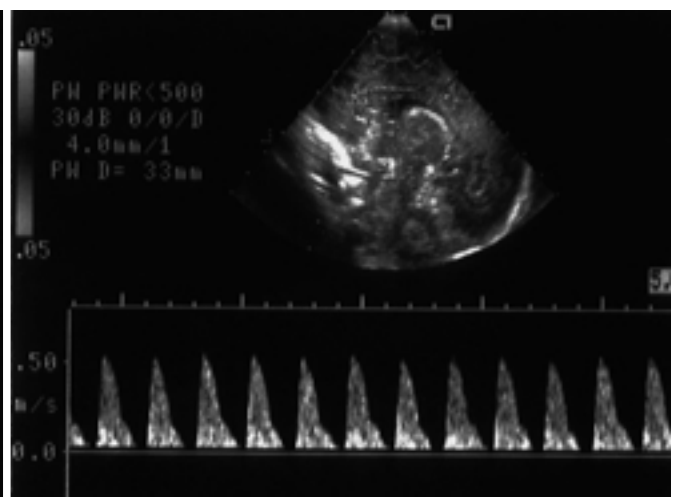
4

RI

RI



A



B

Fig. 1. Doppler sonographic flow measurement in the anterior cerebral artery. **A.** The Doppler profile shows a normal flow profile in an infant with ventricular septal defect. Resistive index was 0.67. **B.** The flow spectrum below shows no diastolic forward flow in an infant with pulmonary atresia and large patent ductus arteriosus. The direction of blood flow via patent ductus arteriosus was completely left to right shunt. Resistive index was 1.0.

가 : 가 가

2 4 가 가 19 4 가 2

가 3, 4 1, 2 (1, 2) (3, 4)

가 student t - test RI (p < 0.05).

RI paired t - test 19 0.84

95% RI 0.72

(p < 0.05). 가 4 3

Norwood Blalock - Taussig shunt 1

Norwood Rastelli

RI 0.85 0.74

69 93 1 24 (34.8%), 2

4(5.8%) , 3 8(11.6%) , 4 33(47.8%)

. RI 0.68, 0.89, 0.69, 0.85 (Table 1).

1

(univentricular heart disease), 4 (tetralogy of Fallot), (transposition of great arteries), (double outlet right ventricle of great arteries), (anomalous pulmonary venous return)

. 2 3 (truncus arteriosus)

1 (pulmonary valve atresia) D)/S][19]. RI 가 , , , [2 - 11].

8 4 RI 가 [12].

2 mm . 3 3 가 RI

가 -

. 1 6 (interruption of aorta)

. 4 33

30 (90.9%) , 4 , 가 RI , 가

, , , 가 RI 가

가

Table 1. Clinical Data and Flow Parameters in the Anterior Cerebral Arteries in Neonates with Congenital Heart Disease

	Group I (24)	Group II (4)	Group III (8)	Group IV (33)
G.A. (weeks)	37.9 ± 1.9	36.9 ± 2.1	37.4 ± 1.8	38.4 ± 2.0
Weight (g)	2808 ± 611	2598 ± 338	2802 ± 693	2840 ± 700
Vs (cm/s)	34.7 ± 5.9	39.5 ± 7.5	37.9 ± 6.7	35.6 ± 6.3
Ved (cm/s)	11.1 ± 2.3	4.4 ± 1.1	11.7 ± 1.9	5.3 ± 1.4
RI	0.68 ± 0.06	0.89 ± 0.04	0.69 ± 0.04	0.85 ± 0.05

G.A. = gestational age, Vs = peak systolic velocity, Ved = end diastolic velocity, RI = resistive index.

RI . Norwood RI Blalock -

Taussig shunt 3 RI

가 [5 - 7].

가

[7, 9].

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= Abstract =

Doppler Ultrasound Evaluation of Cerebral Blood Flow Pattern in Neonates with Congenital Heart Disease

Tae Hoon Kim, M.D.*, Mi Young Kim, M.D.*, Yang Min Kim, M.D.***,
Soo-Hyun Lee, M.D.***, Soo-Jin Kim, M.D.***, Woong-Han Kim, M.D.******

*Department of Radiology, Yongdong Severance Hospital, Seoul

**Department of Radiology, Sejong General Hospital, Pucheon

***Department of Pediatrics, Sejong General Hospital, Pucheon

****Department of Cardiac Surgery, Sejong General Hospital, Pucheon

PURPOSE : To evaluate intracerebral resistive index (RI) values in neonates with congenital heart disease and to investigate their changes after the corrective surgery of the congenital heart disease.

MATERIALS and METHODS : Sixty nine neonates with congenital heart disease who underwent brain ultrasonography were included. Resistive index values were obtained at the genu portion of the anterior cerebral arteries through the anterior fontanelles. The patients were divided into 4 groups according to the presence of associated patent ductus arteriosus (PDA) and intracranial RI values. We evaluated the types of congenital heart disease that could influence RI values.

RESULTS : Resistive index values were statistically higher in patients with PDA than in patients without PDA ($p<0.05$). RI values were higher in cases of large PDA with left-to-right shunt, but within the normal range in cases of small or nearly closing PDA or large PDA with bidirectional blood flow or with right-to-left shunt. For those patients without PDA, RI values were higher when patients had pulmonary atresia with multiple collateral vessels into the lung or when truncus arteriosus was present. RI values were also high in patients with hypoplastic left heart syndrome. RI values were normalized after the ligation of PDA, but patients with hypoplastic left heart syndrome showed persistently high RI values even after the Norwood's operation with Blalock-Taussig shunt.

CONCLUSION : RI values are influenced by various congenital heart diseases except PDA. Therefore, the presences of the congenital heart disease and its hemodynamic changes should be taken into consideration in the evaluation of the intracranial RI values using Doppler ultrasonography.

Address for reprints : Tae Hoon Kim, M.D., Department of Radiology, Yongdong Severance Hospital, Yonsei University,
#146-92 Dogok-dong, Kangnam-gu, Seoul 135-720, Korea.
Tel. 82-2-3497-3156 Fax. 82-2-3462-5472 E-mail: pubmed@naver.com