The Role of the Thyroid in the Developing Heart

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Thyroid • Thyroid hormone • Thyroid hormone receptor • Heart • Chick embryo

Congenital hypothyroidism (CH) is one of the most common diseases of the endocrine system among newborns. Infants with CH have been reported to have a high frequency of congenital cardiovascular malformations (CM), such as ventricular and atrial septal defects [1]. Some studies have demonstrated that these cases were due to gene mutations and neural crest abnormality. Infants with CH and CM have been shown to have significantly lower T_4 levels than those with isolated CH. However, the role of thyroid hormone in the developing heart has not been reported. In this study, we show the thyroid anlage in chick embryos by immunohistochemistry and follow the expression of thyroid hormone receptor during heart development.

1. The thyroid anlage appeared close to the aortic sac at H/H 14 of chick embryos, as determined by immunohistochemistry (Fig. 16.1a).
2. Avians have access to thyroid hormone long before the embryonic thyroid gland starts to secrete hormones due to the hormone deposition in the yolk and egg white [2].
3. We found that the expression of thyroid hormone receptors during embryonic heart development was earlier than that reported previously published study using RT-PCR (Fig. 16.1b) [3].

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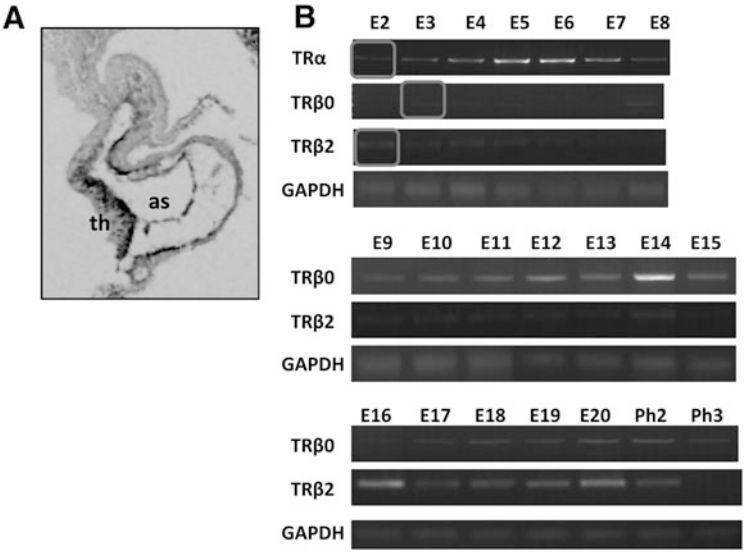

Fig. 16.1 (**a**) The thyroid anlage appeared close to the aortic sac at H/H 14. *as* aortic sac, *th* thyroid anlage. (**b**) The expression of thyroid hormone receptors in the developing chick heart. TRα and TRβ2 were expressed beginning on E2, and TRβ0 was expressed beginning on E3 (*circled*). *E* embryonic day, *Ph* post hatching day

These results suggest that thyroid hormone may contribute to the development of the heart.

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