Cite this as: Menglin ZHOU, Jiansheng JI, Ni XIE, Danqing CHEN. Prediction of birth weight in pregnancy with gestational diabetes mellitus using an artificial neural network[J]. Journal of Zhejiang University Science B, 2022, 23(5): 432-436. http://doi.org/10.1631/jzus.B2100753

Prediction of birth weight in pregnancy with gestational diabetes mellitus using an artificial neural network

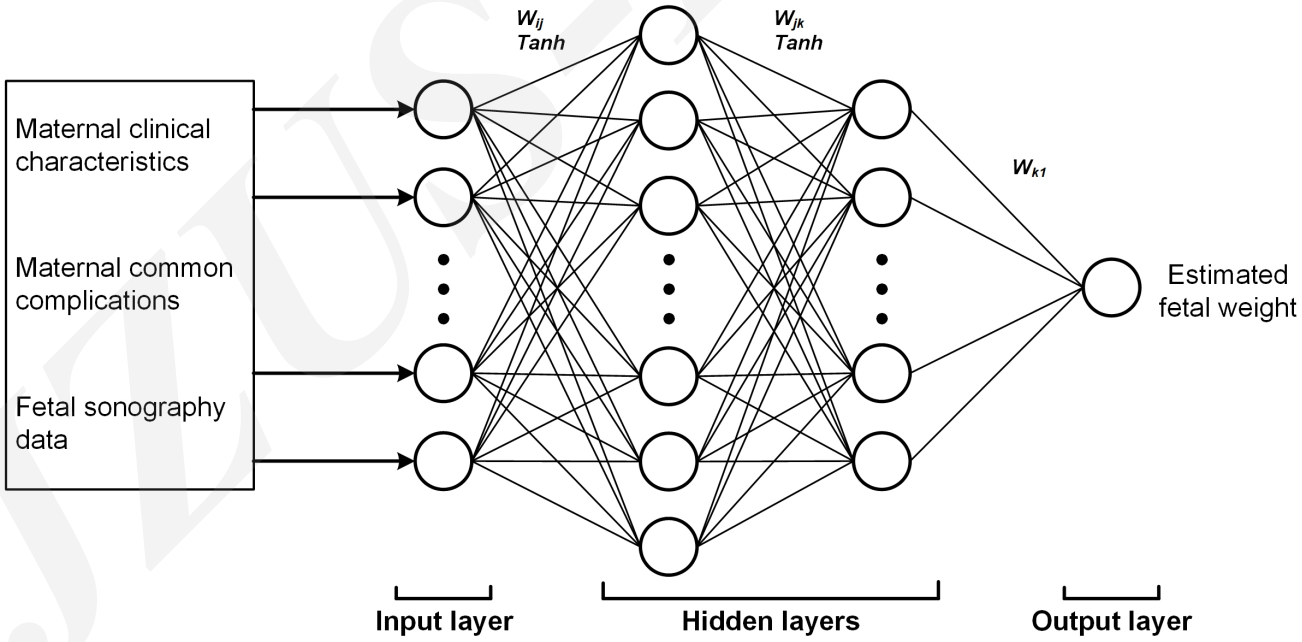
Key words: Gestational diabetes mellitus, Birth weight prediction, Artificial neural network

Research Summary

This correspondence mainly formed an artificial neural network, which performed well on prediction of birth weight in pregnancy with gestational diabetes mellitus







A two-layer artificial neural network for predicting birth weight

Innovation points

In the performance assessment of the ANN, the mean absolute error (MAE) of the predicted birth weight was 153.5±147.9 g, the mean absolute percent error (MAPE) was 4.7%±4.5%, performing much better than conventional predicting methods, though it tended to underestimate large newborns.

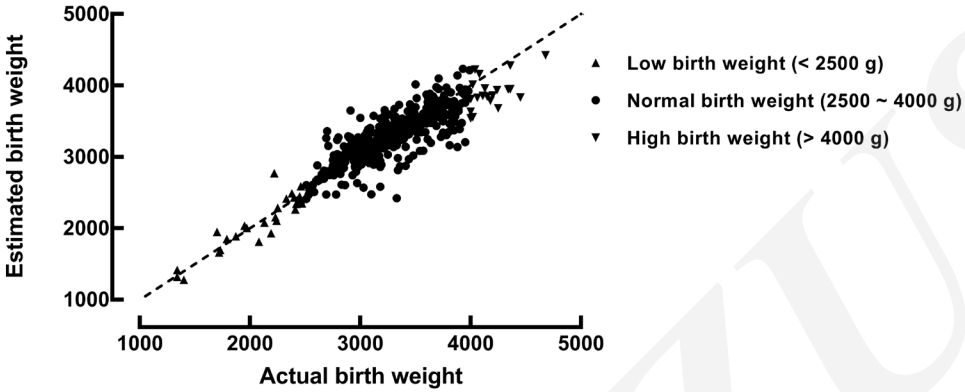
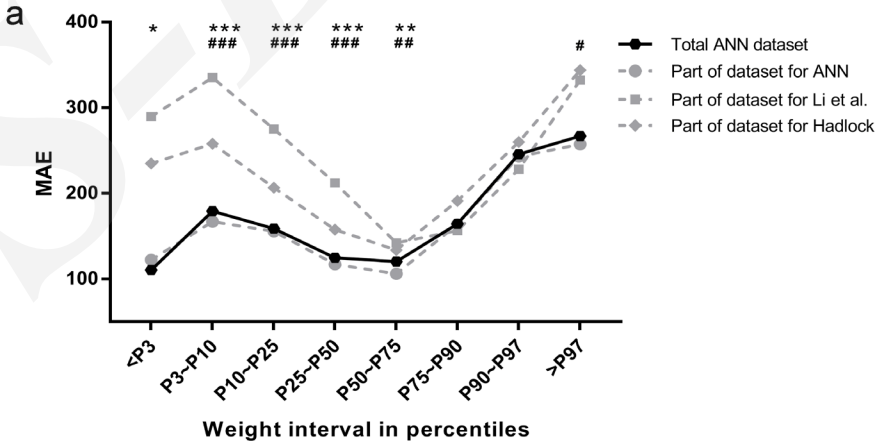


Fig. 1 Estimated birth weight and actual birth weight in the testing dataset.



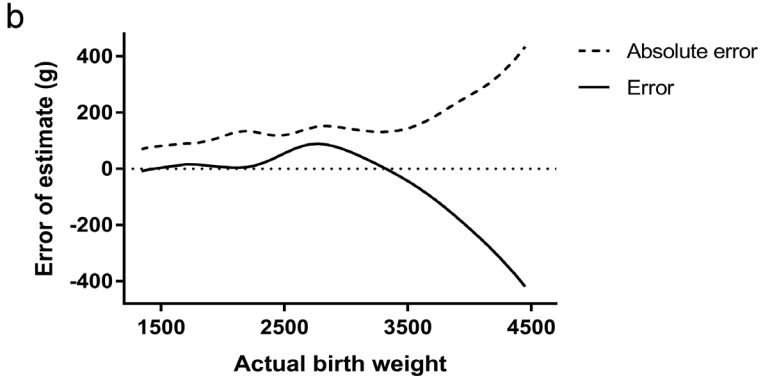


Fig. 2 Estimated error varied with actual birth weight

Table 1. Fetal weight estimation by three methods

Methods	MAE (g)	MAPE (%)	Estimation error within (%)	
			<100 g	<5%
Hadlock *et al.*	192.2±141.0***	6.0%±4.4%***	29.9%***	49.1%***
Li *et al.*	218.5±147.2***	7.0%±4.9%***	23.2%***	38.7%***
ANN	148.5±145.9	4.6%±4.5%	48.3%	66.4%
ANN for all	153.5±147.9	4.7%±4.5%	48.4%	66.1%