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Commentary

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Numbers in radiology and personalized medicine: A commentary

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Abstract

Some of the numbers in radiology used as a criterion to make or rule out a diagnosis for some conditions. These numbers should not be taken for granted since personalized medicine state that every patient is different and should be treated based on his/her condition. Those numbers can't be used as a golden standard in all cases. This commentary will focus on some examples where numbers as a criterion failed or made the diagnosis impossible.

Keywords: Numbers; Radiology; Reference value; Personalized medicine; Criteria

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Commentary

A case of a 47-year-old female with facial and neck pain which fits with symptoms of Eagle syndrome. The length of the elongated styloid processes was measured 3.1 cm and 3.15 cm but both measurements are below the number criteria which are 3.2 cm. The elongated styloid processes and ossified styloid ligaments on both sides cause compression on facial and neck nerves which result in severe pain. Another example is herniated cerebellum or cerebellar tonsils with or without brainstem involvement which divided into benign tonsillar ectopia or low-lying tonsils (<5 mm), cerebellar tonsillar ectopia (>5 mm) tonsils only herniated, Chiari malformation I (>5 mm), Chiari malformation

1.5 (>12 mm) tonsils and brainstem herniated, etc. These numbers for all symptomatic or asymptomatic patients. The numbers used in the criteria are not useful with many patients. Similar to anatomical variations there are reference values variations as well. Any cerebral calcification must be above 300 HU to be considered a calcification, but there is countless patients with dural calcifications that scores below 300 HU, so the number criteria is not practical again. Another example is the exposure factors which vary from an obese patient to a slim patient, an adult to a child, a pregnant (who have a medical necessity) to a non-pregnant woman. Even in the same category for example a neonate needs a different exposure factor compared to a one-year-old baby and both are in the pediatric category. Another example, the amount of



intravenous (IV) contrast media which has a specific rule which is a 1 and ½ millimeter for each kilogram which sometime is not low contrast media in many cases based on clinical experience. Another example is radiation dose where some radiation does might cause too much harm to a particular individual and make no harm to another individual. All the previous examples prove one point that personalized medicine must be used more in radiology. Not all the standard numbers and reference values are carved in stone and can't be changed. Plus, every person is different and these numbers are used to help us, but they can be neglected when it becomes a contradictory and limitation factor.