Outline and evaluate neural mechanisms in aggression.

Normal aggressive behaviour is not dependent on separate brain structures, but interaction of a system of structures.

The characterization of the neural circuits that control aggression is difficult because these circuits also regulate other social behaviours. Indeed, it has been suggested that aggressive behaviours are emergent properties due to the roles of the Amygdala, Hypothalamus and the Periaqueductal grey (PAG). This circuit of the brains structures is in a hierarchy. The Amygdala responds dependant on the lower structures functioning properly, however the lower structures are independent on the Amygdala. This circuit was suggested by Papez in 1937 and later research now supports this key role of the structures and thoughts that several structures interact. Apart from this circuit of structures the role of the Pre-Frontal Cortex is implied to be of importance. The Pre-Frontal Cortex moderates the whole system and controls the outward expression of aggression. Without the Pre-Frontal Cortex the circuit of brain structures including the Amygdala would submit the felling of aggression however only the Pre-Frontal Cortex can act on this and allow for the aggression to be seen. The process of the Pre-Frontal Cortex is involuntary and therefore occurs within a couple of second. Most of the research conducted to support the Pre-Frontal Cortex has been taken out on animals. However it is thought that humans would act in a similar way. There are examples of psychiatric disorders where increased risk of aggression is corresponding o there being a problem with the structure within the circuit. Exaggerated aggressive responses can be observed in both high and low-arousal states, with different biochemical and anatomical systems contributing to behaviour in each context.

The amygdala has long been associated with aggressive behaviour in both animals and humans. Kluver and Bucy removed parts from temporal lobes of rhesus monkeys in the 1930’s. The behavioural changes resulting from this procedure included a loss of fear and a marked taming effect. This showed one of the effects links between the importance of the amygdala and the role it has in aggression. Many other studies done on animals, also reported that the amygdala is key for understanding aggression.

Narabayashi et al (1972) reported that 43 out of 51 patients who received operations to destroy their amygdala showed more normal social behaviour afterwards, including less aggressive behaviour. A further report by Heimburger et al showed similar operations in 48 out of 58 patients showing improvements in aggressive behaviour after the operation. These two studies contribute the state that the amygdala plays a role in aggression and without it one would have reduced aggression.

Mark and Ervin conducted a case study on a female patient in 1970. During electrical simulation of the amygdala, at first exhibited facial grimacing followed by very angry and ultimately flung herself at the wall beating it with her fists. On other occasions she picked up her guitar and threw it in the direction of the psychiatrist. This study shows that activated temporal lobe increase aggression. It further supports by observation of people experiencing temporal love epilepsy becoming more aggressive by those close by. This case study although cannot be generalised to the wider public due to have extremely low population validity and therefore wider evidence is needed to be considered.