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*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/140343> since

*Published version:*

DOI:10.1111/jsm.12355

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This is the author's final version of the contribution published as:

Luigi Rolle;Marco Falcone;Sergio Vighetti;Carlo Ceruti;Omidreza Sedigh;Massimiliano Timpano;Maria Teresa Molo;Lorys Castelli;Mirko Preto;Paolo Gontero;Bruno Frea. Does Sex Reassignment Surgery Induce Cerebral Modifications in MTF Transsexuals?. JOURNAL OF SEXUAL MEDICINE. 11 (1) pp: 312-312.  
DOI: 10.1111/jsm.12355

The publisher's version is available at:

<http://linkinghub.elsevier.com/retrieve/pii/S1743609515305464>

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Link to this full text:

<http://hdl.handle.net/2318/140343>

## Does Sex Reassignment Surgery Induce Cerebral Modifications in MTF Transsexuals?

Luigi Rolle MD, PhD, Marco Falcone MD, Sergio Vighetti PhD, Carlo Ceruti MD, PhD, Omidreza Sedigh MD, Massimiliano Timpano MD, Maria Teresa Molo MD, Lorys Castelli PhD, Mirko Preto MD, Paolo Gontero MD, Bruno Frea MD, PhD

University of Turin, Urology Clinic and Neurophysiology Department

Despite widely accepted biological theories, the etiopathogenesis of the gender dysphoria [1] remains largely unclear.

Several studies have shown the existence of some gender-related cerebral areas. Indeed, various areas belonging to the limbic system such as stria terminalis, preoptic nucleus, and amygdala are characterized by a sexual dimorphism both in macroscopic and microscopic structures [2,3]. Men and women are different in processing cognitive and emotional stimuli [4].

A common neurophysiologic approach to assess cognitive functions is based on event-related potential (ERP) analysis, especially on the evoked component called P300. The P300 wave is a centro-parietal positive deflection in human ERP, which occurs about 300 milliseconds after stimuli's appearance and it is known as the "cognitive wave" [5].

Few scholars have studied male to female (MTF) transsexuals through neurophysiologic studies.

We designed a prospective case-control study. Fifteen MTF transsexuals, aged average 35 years and an age matched control group of 20 healthy right-handed heterosexual volunteers (10 males and 10 females) underwent an emotional ERP test. The cognitive-emotional ERPs were achieved while the subjects were watching slides extracted from the International Affective Picture System (IAPS). Sixty pictures, divided in two series with positive/neutral and negative/neutral valences were shown randomly to the subjects. The area below the P300 wave, its amplitude and latency were compared before and after sex reassignment surgery (SRS) in transsexuals and with control groups.

The P300 component of control females was characterized by a larger latency, amplitude and area, comparing to the male's one, in both the pleasant and unpleasant pictures ( $P < 0,01$ ). All the P300 parameters in the MTF transsexuals increased in response to positive or negative stimuli in the postoperative recordings ( $P < 0,01$ ). Therefore, our ERP analysis evidenced larger amplitude of the P300 in MTF transsexuals in the postoperative recordings in response to positive and negative stimuli. A stronger response is considered a typical female gender-related feature, as evidenced both in the scientific literature and in our control analysis. This may be interpreted as a higher responsiveness to pleasant and unpleasant stimuli in MTF transsexuals with tendency to assume female cerebral features after the sex reassignment surgery.

Different hypothesis can be considered to explain the cerebral modifications evidenced in our study. Indeed, the P300 postoperative modifications can be related to both a biological modification of the cerebral activity or a postoperative psychological well-being of our patients.

In conclusion, according to our preliminary results, MTF transsexuals undergoing a sex reassignment surgery, as well as a genital surgical feminization, tend to assume female cerebral features. In our opinion, these results underline the beneficial effects of the SRS allowing patients to react to the genital surgery conversion with a cerebral feminization. These two effects tend to solve the typical conflict of this disorder: the discrepancy between cerebral and physical features. However, since the gender dysphoria has low incidence, this conclusion shall be validated through prospective studies with larger samples in other specialized centers.

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