Intrauterine insemination (IUI) was used increasingly in the past decade to facilitate pregnancy among subfertile couples. While overall success rates with IUI are well known, the relationship between semen characteristics and IUI remains controversial. Some studies have found good correlation between the total motile sperm count (TMSC) and successful IUI outcome; whereas others have found no such correlation. Furthermore, it is unclear at what sperm count IUI should be abandoned and IVF with or without micromanipulation utilized. Multivariate analysis of live birth rates among infertile couples who underwent IUI at our institution with a cutoff of 5 million post-wash TMSC, showed no correlation with IUI success. The aim of present study was to investigate the relationship among 1) post-wash TMSC, percentage post-wash sperm motility (%Post-MOT), and successful IUI treatment cycles, and 2) to determine the minimal TMSC required to achieve pregnancy with IUI. Five hundred and four women who underwent 1636 IUI cycles with their husband's sperm for the treatment of infertility were included in this retrospective study. Patients were grouped into the following 4 groups according to post-wash TMSC: 1) <0.5 million, 2) 0.5 to 1 million, 3) 1 to 5 million, and 4) >5 million. Post-wash TMSC and %Post-MOT were evaluated between pregnant and non-pregnant women. The pregnancy rate per cycle in all patients was 9.1% with a 6.7% live birth rate. The pregnancy rate per couple was 26.2% with a live birth rate of 20.6%. Similar pregnancy rates of 3.5% (group 1), 2.4% (group 2) 7.0% (group 3), and 6.9% (group 4) were seen among the four groups of patients divided by TMSC (p = 0.35). However, %Post-MOT predicted IUI success at a cutoff value of 40%. Only one pregnancy occurred in the 89 patients with %Post-MOT of less than 40%. Successful IUI outcome can be predicted by the percentage of post-wash sperm motility. These results are important as they can be used by the clinicians to counsel patients regarding their chances of success with IUI procedure, as well as to suggest alternate methods of assisted reproduction.