

The pair *zav/zavah*, referring to a male and a female with unusual genital emissions, is noted in the *chumash (Vayikra)* and is peppered throughout the Talmud. Because a *zav* and *zavah* are discussed together, one assumes that both are equivalent, with gender being the only difference. However, this is false, the difference between this pair is more than the color of their genital emissions, white from a male and red from a female. Their distinction is the etiology of the genital emissions. For a *zav* the emissions, most probably, are due to a contagious bacterial infection, whereas for a *zavah*, the emissions are due to unscheduled uterine discharges, usually of benign consequence. The pair *tumtum/androgynous* is not mentioned in the *chumash* and is described as individuals of indeterminant gender. In reality, the difference between a *tumtum* and an *androgynous* is as great as the difference between night and day. A *tumtum* has a functional urogenital system and is fertile, but due to an unusual, external covering of the genitals, is of indeterminant gender. An *androgynous*, or a true hermaphrodite, has two sets of genitalia and cannot be clearly defined as male or female.

Zav

Specific secretions of the genitals are termed *zov* or *ziva*. A male with such secretions is termed a *zav* and a female with genital secretions (which refers only to blood) is termed a *zavah*. *Vayikra*, chapter 15 discusses the laws of genital emissions from a *zav* and from a *zavah*. Regarding the *zav*, “Any male who will have a discharge from his flesh (i.e., the male organ), his discharge

is contaminated. Thus shall be his contamination when he discharges, whether his flesh runs with his discharge or it becomes stopped up either as a runny secretion or as a thick secretion which obstructs the opening of the urethra.” After discussing rules pertaining to this type of secretion which triggers spiritual contamination, the topic continues, “When the man with the discharge ceases his discharge, he shall count for himself 7 clean days from his cessation, immerse his garments and immerse his flesh in spring water, and become purified. On the 8th day, he shall take for himself two turtle doves or two doves; he shall come before *HaShem* to the entrance of the *Tent of Meeting (Ohel Moed)* and give them to the *Kohen*. The *Kohen* shall make them, one as a sin (*chatas*) offering and one an elevation (*oleh*) offering; thus, the *Kohen* shall provide him atonement before *HaShem* from his discharge” (*Vayikra* 15:13-15). Rashi explained that two emissions make the male a *zav* and impart a level of impurity that requires immersion after 7 clean days but does not trigger the necessity of bringing two offerings. Three distinct emissions up his status to require a count of 7 clean days, immersion, and the bringing of two offerings.

Regarding the *zav*, a few basic questions need answers. If this emission is not the normal seminal emission important in procreation, why and what is it? Upon cessation of the emissions, the *zav* brings two sacrifices, of which one is a sin offering. What sin was committed by the *zav*?

In Talmud (Niddah 35b) note is made of three differences between normal semen from a healthy person and secretions from a zav: (a) semen is viscous, *zov* is runny; (b) semen is a bright shade of white, *zov* is a pale shade of white; and (c) semen emits from an erect organ, *zov* from a limp organ. Dr. Avraham Steinberg [1] summarized other characteristics of a *zav* mentioned in the Mishnah, Talmud, and Responsa: (a) secretions of *zov* emerge without cohabitation (*Zavim* 2:2); (b) cohabitation is difficult for a *zav*, (c) while as a *zav*, the male cannot procreate; and (d) perhaps the most informative clue, from *Vayikra Rabba* (18:1), *zov* emissions occur because of sins from his youth. Rav Mordechai HaKohen linked *zov* with inappropriate sexual behavior (*Sifsei Kohen, Vayikra* 15:2).

Dr. Steinberg [1] noted that all rabbinical sources viewed *zov* as a physical, rather than as a spiritual, illness, with some rabbinical authorities farther noting that the illness was contagious. An illness with such *zov*-like genital secretions, that is contagious, is serious and results from sins in one's youth seems to identify *zov* with a sexually transmitted infection. Ramban (*Vayikra* 15:11) described *zov* as "a severe disease, one of the worst among the contagious diseases, requiring a burnt-offering as a way to thank God, Who healed him. He required a sin-offering as well, as to atone for his sin, lest it cause him any additional illness." Ramban also described *zov* as a physical, not as a spiritual, disorder (*Hilchos Mechusrei Kapparah* 2:1). "Zov is a form of semen that results from an infection in the tubes (of the genital tract). When the discharge of the *zav* flows, it does not do so

forcefully like ejaculate and no pleasure is associated with it. Rather, it flows passively like dough."

Drs. Steinberg [1], Preuss [2], and Brown [3] offered an educated guess that *zov* is gonorrhea, a sexually transmitted infection caused by the bacterium, *Neisseria gonorrhoeae*. Gonorrhea is one of the most frequently reported infectious diseases worldwide, with an estimated 1.14 million new infections/year in the United States. The causative agent, *N. gonorrhoeae*, is a Gram-negative diplococcus bacterium that attaches to epithelial cells, penetrating them, multiplying inside, and producing the endotoxin, LOS. The release of LOS induces an intense inflammatory response, which is responsible for most of the symptoms. Gonorrhea can be a serious infection. If left untreated, a male may develop epididymitis (inflammation of the tube that stores and carries sperm), resulting in infertility. Untreated gonorrhea can spread into the bloodstream and cause disseminated gonococcal infection, a rare but potentially life-threatening condition, leading to heart (endocarditis) and brain (meningitis) complications. Today, antibiotics, such as azithromycin and ceftriaxone, are used to treat gonorrheal infections [4, 5].

If one accepts that *zav* is a gonorrheal infection, then the biological difference between a seminal emission from a healthy male and a genital emission from a *zav* is most apparent. A seminal emission consists of sperm cells released from the body in a fluid termed semen. It appears as a cloudy white or gray liquid with a consistency similar to that of a raw egg or of a runny

jelly. Chemically, semen contains amino acids, fructose, enzymes, minerals, antioxidants, and prostaglandins. A *zav*-gonorrheal emission may manifest by a flow of a clear liquid from the urethra, which rapidly changes to a whitish-yellow purulent discharge that turns yellowish-green with time. It consists of pus, dead cells, cell debris, and mucus [1].

Gonorrhea is spread through sexual fluids, both male semen and female vaginal secretions. In contrast to males, gonorrhea is usually asymptomatic in females. Thus, an infected, unsuspecting female, can transmit the bacterial infection to her baby during childbirth. Babies born to infected mothers are at risk for blindness and low birth weight [4]. Gonorrheal transmission through birthing was recognized in the Talmud: a newborn infant becomes *tamei* if a *zov*-like fluid is emitted from him (Arachin 3a; Niddah 32b, 44a).

The *Mishkan* was constructed early in the travels of *B'nei Yisrael* through the Sinai and the laws pertaining to a *zav* were needed to be quickly known, as a *zav* had restrictions upon his movements within the community. In the desert, the encampment was divided into three areas of holiness, with a *zav* restricted from entering two of the three areas. There was the Camp of the *Shechinah* (Divine Presence), which included the *Mishkan* and its Courtyard, the Camp of the *Leviim*, which surrounded the Courtyard, and the third area, which was the rest of the encampment. A *zav*, as long as he was *tamei*, was forbidden to enter into the inner two camps [6]. In the second year of their exodus from Egypt on the day the

Mishkan was erected, “*HaShem* spoke to Moshe saying, ‘Command the *B'nei Israel* that they shall send away from the camp everyone with *tzarass*, everyone who has had a *zav*-emission, and everyone impure by a corpse” (*Bamidbar* 5:2).

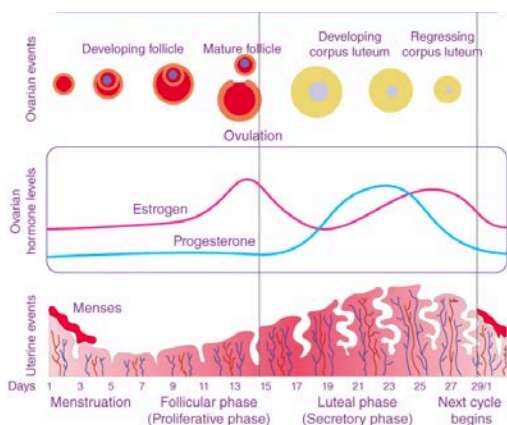
If the illness, *zov*, is an infectious bacterial sexually-transmitted disease, then it can be only acquired through intimate contact with an infected person. From whom did this *zov* acquire the gonorrheal infection; which female served as the reservoir of *N. gonorrhoeae* for transmissions to the male? It was not from a Jewish female, as the *B'nos Yisrael* in Egypt they were praised for their high moral standard, as seen in *parashas Emor* (*Vayikra* 24:10-11). When describing the lineage of the youth who blasphemed the name of *HaShem*, he was described as the son of an Egyptian man and the Israelite woman, *Shelomith* the daughter of *Dibri* of the tribe of Dan. Rashi noted that from all the Jewish women who lived in Egypt for the 190 years, she was the sole female to be intimate with an Egyptian man. If so, from whom and when did these Jewish men, acquire the gonorrheal *zov*-infection? Apparently, these men - now part of the exodus from Egypt - had acquired the gonorrheal infection years earlier in Egypt, from sexual associations with promiscuous female Egyptians (*i.e.*, “sins of their youth”). That some Jewish males had low moral standards was noted in *parashas Balak* (*Bamidbar* 25:1): “Israel settled in the *Shittim* and the people began to commit harlotry with the daughters of Moab.”

Dr. Steinberg [1] noted an interesting statistic on the occurrence of gonorrhea

(zov) in the 1960s/1970s in Israel. Between 1963 to 1967, the incidence of gonorrhoea in Israel was 0.18 cases per thousand. By 1970, this frequency increased to 0.4 cases per thousand. The increase was correlated to the Six Day War, when thousands of young Jewish youth/young adults poured into Israel to serve as volunteers. This world-wide influx of Jewish volunteers arrived from countries where sexual promiscuity was prevalent, thus, causing the increased incidence of gonorrhoeal infections in Israel.

Zavah

To understand the status of a *zavah*, a brief overview of the female reproductive internal anatomy is required. The ovary and the uterus are distinct structures, not physically connected to one another and each with a distinct function. Scientists speak of the menstrual cycle consisting of two components, the ovarian cycle and the uterine cycle, which run concurrently and are coordinated, lasting between 21 and 35 days, with a median length of 28 days. Please refer to Figure 1.



The focus of the ovarian cycle is (a) the maturation of an immature primary oocyte to a secondary oocyte, which is the

forerunner of the egg, and (b) the cyclic production and release of the hormones, estrogen and progesterone. Maturation of a primary oocyte to the secondary oocyte takes 14 days, with the structure housing the mature secondary oocyte, termed the mature or Graafian follicle. The growing Graafian follicle is the source of estrogen. On day 14 of the ovarian cycle the Graafian follicle ruptures and releases the secondary oocyte from the ovary into the oviduct (fallopian tube) of the uterus. This process is termed ovulation. The remnants of the Graafian follicle form the corpus luteum, which produces progesterone (Figure 1).

The uterine cycle oversees the preparation and maintenance of the uterus to receive a multicellular embryo. Rising levels of estrogen released from the ovary stimulate proliferation of the endometrium, *i.e.*, the lining of the uterus, to thicken and to become vascular and glandular. This portion of the menstrual cycle, termed the proliferative phase, is accompanied by engorgement of the endometrium with blood vessels. This is followed by the secretory phase in which the rising levels of progesterone stimulate the development of uterine glands to produce a thick mucoid secretion. The body is orchestrating the construction of a nutritive bedding for implantation of an embryo, should fertilization occur (Figure 1).

Fertilization occurs in the oviduct, in which a sperm cell penetrates the secondary oocyte. Entrance of a sperm into the secondary oocyte is the stimulus for it to complete the maturation process and become an egg. Internal fusion of the egg

nucleus with the sperm nucleus forms the zygote, which immediately starts dividing to form a multicellular embryo. The embryo slowly meanders down the oviduct and, upon entering the main body of the uterus, implants into the thickened endometrium. Blood vessels in the endometrium furnish nutrients to the growing embryo.

If fertilization does not occur, the endometrial lining of the uterus breaks down and endometrial tissue and blood are released, moving down the vaginal canal. This shedding of endometrial tissue and blood, termed menstruation (a "period" in common terminology), is a sign that pregnancy has not occurred; menstruation lasts for about 5 days (Figure 1).

Menstruation is a monthly event experienced by a normal, healthy woman. A woman shedding blood at the beginning of the menstrual cycle, as seen in Figure 1, is deemed a *niddah*, which triggers various halachos of ritual purity (*taharah*) and impurity (*tumah*). As explained by Rambam (Mishnah Torah, *Hilchos Issurei Bi'ah* 6:15) all menstruating women are given a status of *niddah* for 7 days, even if their period lasted from 3 to 5 days. According to Biblical law, there is an 11-day time span from the end of her 7-day *niddah* status to the end of the 18th day from the start of her *niddah* status, termed days of *zivah* (or, days of a running flow). If the woman saw a blood discharge during this 11-day period, she is deemed a *zavah*.

The intent of this long introduction was to clarify that the blood discharge of a *niddah* and the blood discharge of a *zavah*, albeit both from the endometrium, are two distinct

events - one normal and expected and the other unexpected and potentially indicative of a malady. Figure 1 shows that *niddah* blood/tissue is shed from a very thickened endometrium, engorged with blood vessels, and with numerous secretory glands. The entire endometrium that was prepared to receive the embryo is shed. Shedding of *niddah* blood/tissue is under the control of reproductive hormones, and usually lasts from 3 to 5 days (with a range from 1 to 8 days) and about 30 to 80 ml of blood are lost (range 20 to 100 ml) [1]. The discharge of *zavah* blood during the 11-day time frame is unexpected and may involve an endometrium in the proliferative and/or in the early secretory phase of the menstrual cycle, thereby influencing the amount of shed tissue/blood (Figure 1).

For a consecutive 2-day emission of *zivah* blood the woman is deemed a *zavah ketanah* and for a consecutive 3-day emission she is a *zavah gedolah*. Each classification triggers different *halachos*. In this discussion, an important distinction is that a *zavah gedolah*, upon completion of counting 7 clean days and immersion in spring water or in a *mikvah*, requires that she bring two offerings, one a sin (*chatas*) offering and one an elevation (*oleh*) offering women (*Vayikra* 15:19-33).

What sin did she commit that required a *chatas* offering? The *S'forno* (*Vayikra* 15:19) tackles this question and answers as follows: "Thus, the Torah testifies that this (i.e., her being a *zivah gedolah*) does not normally occur with the daughters of His people, except to alert them to the early rebellion in deed and in thought, for it is, in

actuality, merely an extension of the punishment with which Chava was punished for her deed and thought, included in His saying, “I will greatly multiply your pain” (*Bereshis* 3:16). Therefore it is fitting that she will count 7 clean days until a spirit of repentance and purity ‘pours over her’ and then she will immerse herself and achieve atonement for her misdeeds through the *chatas* offering and from her (improper) thoughts through the *oleh* offering.” Targum Yonathan (*Koheles* 10:18) suggested that the *zavah gedolah* state was a Divine punishment imposed upon a woman who was not careful with the laws of *niddah*.

Today, *zavah* bleeding is termed “unscheduled bleeding,” with such uterine bleeding being secondary to menstrual bleeding [1]. Most often, shedding *zivah* blood, albeit unexpected, is of no adverse health significance. The Talmud noted several factors that induce uterine bleeding in some women: jumping, carrying a heavy load, illness, sudden fright (*Niddah* 39a), and desire for intimacy (*Niddah* 20b) [7]. The increased level of the stress hormone, cortisol, during fright, influences the reproductive cycle by creating an imbalance in the levels of the reproductive hormones. Even if a woman has not ovulated, hormonal imbalances confuse the body and may induce irregular bleeding [8]. The Talmud also noted that the consumption of garlic, onions, and peppers (*Niddah* 63b), perhaps acting as uterine irritants, induce shedding of *zivah* blood in some women. A host of other botanicals, *e.g.*, motherwort, ginger, turmeric, *etc.*, act as blood thinners and induce intrauterine bleeding [9]. Ramban (*Vayikra* 15:19) noted that excessive *zavah*

bleeding is indicative of a serious illness (although not contagious, as he mentioned with *zav*). Unfortunately, there are many candidates that may induce unscheduled uterine bleeding, including sexually transmitted infections, such as chlamydia or gonorrhea, endometriosis, cervical polyps, polycyclic ovary syndrome, and malignancy[10].

Before leaving *niddah* and *zavah*, an interesting topic is neonatal menstruation. The Talmud (*Niddah* 32a) noted that menstruation may occur even in a one-day old female neonate. When taught to a class of high school boys or college young men this undoubtedly evokes laughter, as being ridiculous. However, the Talmud noted that this was not so uncommon and current medicine agrees, as it occurs in about 5% of all female newborns and is considered of no clinical significance. Neonatal menstruation, medically termed “neonatal uterine bleeding” or “neonatal menstrual-like bleeding,” is due to placental estrogenic stimulation of the endometrium *in utero* and the sudden withdrawal of in utero progesterone upon birth [11,12]. To make this a bit more interesting, Rashi noted (*Niddah* 32a) that if the neonate menstruant also experienced blood discharges on days 8, 9 and 10 of life, then she would be a *zavah gedolah*. Thus, a *zavah gedolah* can be a 10-day old baby.

To avoid confusion to the reader, it is noted that today the terms *zavah* (an unexpected, abnormal discharge) and *niddah* (a monthly expected discharge, *i.e.*, “menstruation”) are no longer distinguishable. Jewish women adopted the stringency that viewing even

one drop of blood the size of a mustard seed is sufficient to require the counting of 7 clean days as if she was a *zavah gedolah*. This applies even if the bleeding occurred during the normal time of menstruation and whether it was observed on 1, 2, 3, or all 7 days or more, she counts 7 clean days as would a *zavah gedolah* and afterwards immerses in a *mikvah* [1].

Tumtum

According to Rambam (*Hilchos Ishus* 2:24), “Whomever has neither male or female organs visible but is closed (“*atum*”) is called a *tumtum* and this child is a matter of doubt. If the *tumtum* is torn (*i.e.*, the covering is removed) and is found to be a male, then he is certainly a male, and if found to be female, she is a female.” A *tumtum*, as noted by Steinberg [1], is a “rare occurrence.”

The word *tumtum* means closed, sealed, or hidden. A *tumtum*'s genitals are not visible because of a skin membrane covering that area of the body. Therefore, a *tumtum*'s reproductive ability is prevented by this outer covering, but, once removed, would allow the *tumtum* to procreate. For excretory needs, at the site of the male and female urogenital organ, is an orifice on the covering to allow for urination [2]. The Talmud (*Yevamos* 83b) related the incident of a *tumtum* from the town of Bairi, who had the eternal skin covering surgically removed, and fathered seven children. The Talmud is stressing that a *tumtum* is a normal, healthy individual with a functional reproductive system, albeit blocked by an external barrier. As long as the blockage is

present, the *tumtum* is a person of indeterminant gender.

Wiesen and Kulak [13] reviewed whether *halachically* a *tumtum* must uncover its true gender identity (*i.e.*, “*koreyah*”- to rip off the skin), as discussed by the Rashba (*Yevamos* 70a) and Tosafot (*Pesachim* 28b). They noted that in the time of the Talmud, most probably, it was not mandatory due to the danger of an invasive surgical procedure performed by physicians with no prior experience in such operations and that it was an exceedingly uncommon medical condition. However, with the medical proficiency and sophistication of today, such an operation is not problematic and it may be mandatory for a *tumtum* to uncover its true gender.

Tumtum appears in the Mishnah, the Tosefta, Talmud Bavli, and Talmud Yerushalmi, but not in *Ta'nach*. All, if not most, of the references to a *tumtum* refer to an adult, *i.e.*, a post-pubescent individual. If so, and if a *tumtum* is a healthy, normal individual with functional neuroendocrine and genital systems, why was there no mention of the appearance of secondary sexual characteristics that accompany puberty. A male *tumtum* should develop upper body musculature, facial hair, and a deepening voice, whereas a female *tumtum* should menstruate, develop breasts, and show a widening of the hips. At post-puberty the gender of a *tumtum* should be self-evident.

Unable to find an answer to this question, two possibilities are presented. One possible answer is that *Chazal* were aware that the appearance of secondary sexual characteristics crosses genders and thus

cannot be used as proof of the gender of an individual. For example, a woman with facial hair (Kiddush 35b); gynecomastia (female-type breasts on a male), and galactorrhea (male lactation) (Shabbos 53b) were known. Apparently, sexual secondary characteristics are not 100% indicative of gender. A second thought is based upon the Talmud (*Chagigah* 4a; *Yevamos* 72a) which noted a form of *tumtum* for which the testicles were visible, but the male organ was covered. This individual was viewed *halachically* as a *tumtum*, not as a male; for identification as a male, the entire male genitalia must be visible. If the *halacha* is the visibility of the entire genitalia are required for gender identification, then the presence or absence of secondary sexual characteristics is a non-issue. Viewing the entire genitalia avoids mistakes. Consider a woman with Turner's syndrome, thought to be an *aylonis* in Talmudic terminology [14]. Instead of two X chromosomes in each somatic (body) cell, this woman has one X chromosome per cell. She is infertile, lacks a fully mature uterus, does not menstruate, and lacks female-type breasts. Thus, a post-pubescent *aylonis tumtum* would be thought to be a male, thus highlighting, the need to view genitalia to ascertain gender.

A *tumtum* may not marry a *tumtum* as there is the possibility that this would be a same-sex marriage. There is an interesting passage in the Talmud (*Yevamos* 64a, b) in which Rav Ammi offered an explanation as to why it took Avraham and Sarah such a long time to conceive a child. He suggested that they were both *tumtumim*. If so, how could *tumtumim* they marry each other? Perhaps, their outer coverings were

removed, either naturally or surgically, prior to marriage or they relied upon the appearance of their secondary sexual characteristics for gender identity.

Androgynous

An androgynous, i.e., a hermaphrodite, is clearly defined by Rambam: "whoever has both a male sexual reproductive organ and a female sexual reproductive organ is called an androgynous. It is not clear whether he is a male or female; there is no clear sign to indicate whether he is definitely male or definitely female." Rabbi Meir, in Mishnah *Bikkurim* 4:1-5, described an androgynous as a unique creation in its own image (*briah binei atzmo*).

Rambam's definition excludes cases of pseudohermaphroditism, such as androgen insensitivity syndrome (testicular feminization syndrome) in which an XY individual (genotypic male) has an external structure that resembles female genitalia and, at puberty develops female-type breasts, or of congenital adrenal hyperplasia in which an XX individual (genotypic female) has external male-appearing genitalia [16]. A true hermaphrodite as described by Rambam is very rare. About 10-15% of such people may be chimeras, arising from the fusion of two zygotes. In this scenario a woman ovulated two eggs, one was fertilized by an X-bearing sperm and one by a Y-bearing sperm. Two zygotes formed and this woman was expected to carry dizygotic twins, one a female (XX) and one a male (XY). However, *in utero* these two zygotes fused resulting in a tetragametic zygote, with two distinct populations of embryonic cells, some XY

and some XX. Depending on cell migrations during embryo and fetal development there is a possibility that this chimera can develop two distinct sexual genitalia, one male and one female.

Rabbi Weitzman [16] questioned the logic of basing gender solely on viewing the genitalia. Consider individuals with a deficiency of the enzyme, 5- α -reductase, which is an autosomal recessive disorder. A genotypic XY male who is homozygous recessive for the gene encoding for 5- α -reductase is born with all the internal male structures, but externally, the individual appears as a female. The enzyme, 5- α -reductase, catalyzes the conversion of testosterone to dihydrotestosterone (DHT), which is involved in the formation of the male organ. Without that enzyme, at birth, the child appears female. Based on appearance, at this point, the child would be a *halachic* female. At puberty, the adrenal glands produce testosterone and this “female” starts to exhibit signs of maleness - voice deepens, growth of facial hair, upper body musculature develops, and, what was thought to be a clitoris develops into the male organ. Sperm development may be normal and some of these individuals may father offspring. At puberty, based on visible genitalia, this individual would now be a *halachic* male. This is not a fairy tale. In the 1970s, 22 young girls in the Dominican Republic reached puberty and transformed into 22 young boys. In that Central American society, because of consanguinity, this occurrence was not a surprise and was so common that it was even given a special name, “*guevedoces*” - for “male organ at age 12” [17].

Based on situations such as the case cited above, Rabbi Weitzman [16] suggested that a more fluid model, rather than viewing genitalia as the sole criterion, is needed in assessing the gender of a child. He proposed “that each case should be examined individually by *halakhic* authorities, based on both genetic karyotype and the phenotype, and the relationship between the two.” A similar thought was presented by Wiesen and Kulak [13] and Brown [15].

Based upon my readings of the literature, the incidence of these gender issues indicates that pseudohermaphroditism is the more common gender issue, which includes a variety of subgroups, such as androgen insensitivity syndrome (noted in Talmud Niddah 40b [14, 18]) and congenital adrenal hyperplasia (CAH), which occurs in two forms, classical (severe) and non-classical (mild). Non-classical CAH is an autosomal recessive disorder with a high incidence in Ashkenazi Jews, affecting 3.7% of the population and with a carrier rate of 30.9% [19]. True hermaphroditism is extremely rare and *tumtum* is exceedingly very rare [1].

The reader is directed to the article by Cohen [20] for the *halachos* applicable to a *tumtum* and to an *androgynous*.

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References

- [1] Steinberg, A., 2003, Encyclopedia of Jewish Medical Ethics, vol. 1-3, Feldheim Publ., N.Y., N.Y.
- [2] Preuss, J., 2004, Biblical and Talmudic Medicine, Jason Aronson, Inc., Northvale, N.J.
- [3] Brown, J., 2015, Nazir 65b, The zov and gonorrhea, Talmudology.com.
- [4] Cleveland Clinic, 2022, Gonorrhea, <https://my.clevelandclinic.org>.
- [5] UC San Diego School of Medicine, n.d., Neisseria gonorrhoeae: drug resistant gonorrhea, <https://medschool.ucsd.edu>.
- [6] Artscroll, 2020, The Chumash with the Teachings of the Talmud, Vayikra, Mesorah Publ., Brooklyn, NY.
- [7] Brown, J., 2018, Queen Esther's fight or flight reaction, Talmudology.com.
- [8] Vlnay, N., 2022, Stress and abnormal uterine bleeding (): is there a connection? [ps://www.medanta.org/patient-education-blog/stress-and-abnormal-uterine-bleeding-aub-is-there-a-connection](https://www.medanta.org/patient-education-blog/stress-and-abnormal-uterine-bleeding-aub-is-there-a-connection).
- [9] Abebe, W., 2018, Review of herbal medications with the potential to cause bleeding: dental implications, and risk prediction and prevention avenues, EPMA J, 10:51-64.
- [10] Nelson, L., n.d., Abnormal uterine bleeding, Dignity Health. Org
- [11] Achanna, K.S. and Nanda, J., 2022, Evaluation and management of abnormal uterine bleeding, Med. J. Malaysia, 77:374-383.
- [12] Brown, J., 2019, Neonatal menstruation, Talmudology.com
- [13] Wiesen, J. and Kulak, D., 2007, "Male and female He created them:" revisiting gender assignment and treatment in intersex children. J. Halacha Contemp. Soc. 54:5-29.
- [14] Babich, H., 2023, The science behind some Mishnaic and Talmudic passages, Derech HaTeva. A Journal of Torah and Science, 27:55-65.
- [15] Brown, J., 2019, The tumtum, the androgyne, and the fluidity of gender, Talmudology.com.
- [16] Weitzman, G., 2009, Is gender determined by external organs or by genes? B'or HaTorah 19: 27-35.
- [17] Lewis, R., 2018, Human Genetics, McGraw Hill, NY, NY.
- [18] Goodman, R.M. and Plato, C., 1982, A Talmudic reference to a family of probable testicular feminization syndrome, Koroth 8:40-47.
- [19] Jha. S. and Turcu, A.F., 2021, Non-classic congenital adrenal hyperplasia. What do endocrinologists need to know? Endocrinol. Metab. Clin. North Amer., 50:151-165.
- [20] Cohen, A., 1999, Tumtum and androgynous, J. Halacha Contemp. Soc., 38:62-85.